

WO 01/04150

PCT/EP00/06943

SEQUENCE LISTING

<110> I. N. S. E. R. M.

MAX-PLANCK-GESELLSCHAFT ZUR FÖRDERUNG DES WISSENS

<120> Novel *Neisseria meningitidis* compounds and
anti-infection applications thereof

<130> 989 SEQUENCES

<140>

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<160> 116

<170> PatentIn Ver. 2.1

<210> 1

<211> 696

<212> DNA

<213> *Neisseria meningitidis*

<400> 1

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<213> *Neisseria meningitidis*

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Ala Ala Cys Ser Lys Gln Ala Glu Thr Ser Val Pro Ala Asp Ser Ala
      20                   25                   30

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Gln Ser Ser Ser Ser Ala Pro Ala Ala Pro Ala Glu Leu Asn Glu Gly
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 Val Asn Tyr Thr Val Leu Ser Thr Pro Ile Pro Gln Gln Ala Gly
 50 55 60
 Lys Ile Glu Val Leu Glu Phe Phe Gly Tyr Phe Cys Pro His Cys Ala
 65 70 75 80
 His Leu Glu Pro Val Leu Ser Glu His Ile Lys Thr Phe Lys Asp Asp
 85 90 95
 Thr Tyr Met Arg Arg Glu His Val Val Trp Gly Asp Glu Met Lys Pro
 100 105 110
 Leu Ala Arg Leu Ala Ala Ala Val Glu Met Ala Gly Glu Ser Asp Lys
 115 120 125
 Ala Asn Ser His Ile Phe Asp Ala Met Val Asn Gln Lys Ile Asn Leu
 130 135 140
 Ala Asp Thr Asp Thr Leu Lys Lys Trp Leu Ser Glu Gln Thr Ala Phe
 145 150 155 160
 Asp Gly Lys Lys Val Leu Ala Ala Phe Glu Ala Pro Glu Ser Gln Ala
 165 170 175
 Arg Ala Ala Gln Met Glu Glu Leu Thr Asn Lys Phe Gln Ile Ser Gly
 180 185 190
 Thr Pro Thr Val Ile Val Gly Gly Lys Tyr Gln Val Glu Phe Lys Asp
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 Glu Glu Gln Lys Lys Pro Gln
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<213> *Neisseria meningitidis*

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          20              25              30

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Gln Ser Ser Ser Ser Ala Pro Ala Ala Pro Ala Glu Leu Asn Glu Gly
      35              40              45

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Val Asn Tyr Thr Val Leu Ser Thr Pro Ile Pro Gln Gln Gln Ala Gly
      50              55              60

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Lys Ile Glu Val Leu Glu Phe Phe Gly Tyr Phe Cys Pro His Cys Ala
      65              70              75              80

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His Leu Glu Pro Val Leu Ser Glu His Ile Lys Thr Phe Lys Asp Asp
          85              90              95

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Thr Tyr Met Arg Arg Glu His Val Val Trp Gly Asp Glu Met Lys Pro
      100              105              110

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Leu Ala Arg Leu Ala Ala Ala Val Glu Met Ala Gly Glu Ser Asp Lys
      115              120              125

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Ala Asn Ser His Ile Phe Asp Ala Met Val Asn Gln Lys Ile Asn Leu
      130              135              140

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Ala Asp Thr Asp Thr Leu Lys Lys Trp Leu Ser Glu Gln Thr Ala Phe
      145              150              155              160

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Asp Gly Lys Lys Val Leu Ala Ala Phe Glu Ala Pro Glu Ser Gln Ala

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 180 185 190
 Thr Pro Thr Val Ile Val Gly Gly Lys Tyr Gln Val Glu Phe Lys Asp
 195 200 205
 Trp Gln Ser Gly Met Thr Thr Ile Asp Gln Leu Val Asp Lys Val Arg
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 Glu Glu Gln Lys Lys Pro Gln
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 Gln Ser Ser Ser Ser Ala Pro Ala Ala Pro Ala Glu Leu Asn Glu Gly
 35 40 45

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Val Asn Tyr Thr Val Leu Ser Thr Pro Ile Pro Gln Gln Gln Ala Gly
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Lys Ile Glu Val Leu Glu Phe Phe Gly Tyr Phe Cys Pro His Cys Ala
65 70 75 80

His Leu Glu Pro Val Leu Ser Glu His Ile Lys Thr Phe Lys Asp Asp
85 90 95

Thr Tyr Met Arg Arg Glu His Val Val Trp Gly Asp Glu Met Lys Pro
100 105 110

Leu Ala Arg Leu Ala Ala Ala Val Glu Met Ala Gly Glu Ser Asp Lys
115 120 125

Ala Asn Ser His Ile Phe Asp Ala Met Val Asn Gln Lys Ile Asn Leu
130 135 140

Ala Asp Thr Asp Thr Leu Lys Lys Trp Leu Ser Glu Gln Thr Ala Phe
145 150 155 160

Asp Gly Lys Lys Val Leu Ala Ala Phe Glu Ala Pro Glu Ser Gln Ala
165 170 175

Arg Ala Ala Gln Met Glu Glu Leu Thr Asn Lys Phe Gln Ile Ser Gly
180 185 190

Thr Pro Thr Val Ile Val Gly Gly Lys Tyr Gln Val Glu Phe Lys Asp
195 200 205

Trp Gln Ser Gly Met Thr Thr Ile Asp Gln Leu Val Asp Lys Val Arg
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Glu Glu Gln Lys Lys Pro Gln
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<212> DNA

<213> Neisseria meningitidis

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<213> Neisseria meningitidis

<400> 8

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Ala Ala Cys Ser Lys Gln Ala Glu Thr Ser Val Pro Ala Asp Ser Ala
                20                      25                      30

```

```

Gln Ser Ser Ser Ser Ala Pro Ala Ala Pro Ala Glu Leu Asn Glu Gly
        35                      40                      45

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```

Val Asn Tyr Thr Val Leu Ser Thr Pro Ile Pro Gln Gln Gln Ala Gly
        50                      55                      60

```

```

Lys Ile Glu Val Leu Glu Phe Phe Gly Tyr Phe Cys Pro His Cys Ala
        65                      70                      75                      80

```

```

His Leu Glu Pro Val Leu Ser Glu His Ile Lys Thr Phe Lys Asp Asp
                85                      90                      95

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```

Thr Tyr Met Arg Arg Glu His Val Val Trp Gly Asp Glu Met Lys Pro
        100                      105                      110

```

```

Leu Ala Arg Leu Ala Ala Ala Val Glu Met Ala Gly Glu Ser Asp Lys
        115                      120                      125

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```

Ala Asn Ser His Ile Phe Asp Ala Met Val Asn Gln Lys Ile Asn Leu
        130                      135                      140

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Ala Asp Thr Asp Thr Leu Lys Lys Trp Leu Ser Glu Gln Thr Ala Phe
        145                      150                      155                      160

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Asp Gly Lys Lys Val Leu Ala Ala Phe Glu Ala Pro Glu Ser Gln Ala
                165                      170                      175

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Arg Ala Ala Gln Met Glu Glu Leu Thr Asn Lys Phe Gln Ile Ser Gly
 180 185 190

Thr Pro Thr Val Ile Val Gly Gly Lys Tyr Gln Val Glu Phe Lys Asp
 195 200 205

Trp Gln Ser Gly Met Thr Thr Ile Asp Gln Leu Val Asp Lys Val Arg
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Glu Glu Gln Lys Lys Pro Gln
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<212> DNA

<213> Neisseria meningitidis

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<212> PRT

<213> Neisseria meningitidis

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Ala Ala Cys Ser Lys Gln Ala Glu Thr Ser Val Pro Ala Asp Ser Ala
 20 25 30

Gln Ser Ser Ser Ser Ala Pro Ala Ala Pro Ala Glu Leu Asn Glu Gly
 35 40 45

Val Asn Tyr Thr Val Leu Ser Thr Pro Ile Pro Gln Gln Gln Ala Gly

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Lys Ile Glu Val Leu Glu Phe Phe Gly Tyr Phe Cys Pro His Cys Ala		
65	70	75 80
His Leu Glu Pro Val Leu Ser Glu His Ile Lys Thr Phe Lys Asp Asp		
	85	90 95
Thr Tyr Met Arg Arg Glu His Val Val Trp Gly Asp Glu Met Lys Pro		
	100	105 110
Leu Ala Arg Leu Ala Ala Ala Val Glu Met Ala Gly Glu Ser Asp Lys		
	115	120 125
Ala Asn Ser His Ile Phe Asp Ala Met Val Asn Gln Lys Ile Asn Leu		
	130	135 140
Ala Asp Thr Asp Thr Leu Lys Lys Trp Leu Ser Glu Gln Thr Ala Phe		
145	150	155 160
Asp Gly Lys Lys Val Leu Ala Ala Phe Glu Ala Pro Glu Ser Gln Ala		
	165	170 175
Arg Ala Ala Gln Met Glu Glu Leu Thr Asn Lys Phe Gln Ile Ser Gly		
	180	185 190
Thr Pro Thr Val Ile Val Gly Gly Lys Tyr Gln Val Glu Phe Lys Asp		
	195	200 205
Trp Gln Ser Gly Met Thr Thr Ile Asp Gln Leu Val Asp Lys Val Arg		
	210	215 220
Glu Glu Gln Lys Lys Pro Gln		
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<212> DNA

<213> Neisseria meningitidis

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<213> Neisseria meningitidis

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 20 25 30

Gln Ser Ser Ser Ser Ala Pro Ala Ala Pro Ala Glu Leu Asn Glu Gly
 35 40 45

Val Asn Tyr Thr Val Leu Ser Thr Pro Ile Pro Gln Gln Gln Ala Gly
 50 55 60

Lys Ile Glu Val Leu Glu Phe Phe Gly Tyr Phe Cys Pro His Cys Ala
 65 70 75 80

His Leu Glu Pro Val Leu Ser Glu His Ile Lys Thr Phe Lys Asp Asp
 85 90 95

Thr Tyr Met Arg Arg Glu His Val Val Trp Gly Asp Glu Met Lys Pro
 100 105 110

Leu Ala Arg Leu Ala Ala Ala Val Glu Met Ala Gly Glu Ser Asp Lys
 115 120 125

Ala Asn Ser His Ile Phe Asp Ala Met Val Asn Gln Lys Ile Asn Leu
 130 135 140

Ala Asp Thr Asp Thr Leu Lys Lys Trp Leu Ser Glu Gln Thr Ala Phe
 145 150 155 160

Asp Gly Lys Lys Val Leu Ala Ala Phe Glu Ala Pro Glu Ser Gln Ala
 165 170 175

Arg Ala Ala Gln Met Glu Glu Leu Thr Asn Lys Phe Gln Ile Ser Gly
 180 185 190

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Thr Pro Thr Val Ile Val Gly Gly Lys Tyr Gln Val Glu Phe Lys Asp
 195 200 205

Trp Gln Ser Gly Met Thr Thr Ile Asp Gln Leu Val Asp Lys Val Arg
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Glu Glu Gln Lys Lys Pro Gln
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<212> DNA

<213> *Neisseria meningitidis*

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<213> *Neisseria meningitidis*

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 20 25 30

Gln Ser Ser Ser Ser Ala Pro Ala Ala Pro Ala Glu Leu Asn Glu Gly
 35 40 45

Val Asn Tyr Thr Val Leu Ser Thr Pro Ile Pro Gln Gln Gln Ala Gly
 50 55 60

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PCT/EP00/06943

Lys Ile Glu Val Leu Glu Phe Phe Gly Tyr Phe Cys Pro His Cys Ala
 65 70 75 80

His Leu Glu Pro Val Leu Ser Glu His Ile Lys Thr Phe Lys Asp Asp
 85 90 95

Thr Tyr Met Arg Arg Glu His Val Val Trp Gly Asp Glu Met Lys Pro
 100 105 110

Leu Ala Arg Leu Ala Ala Ala Val Glu Met Ala Gly Glu Ser Asp Lys
 115 120 125

Ala Asn Ser His Ile Phe Asp Ala Met Val Asn Gln Lys Ile Asn Leu
 130 135 140

Ala Asp Thr Asp Thr Leu Lys Lys Trp Leu Ser Glu Gln Thr Ala Phe
 145 150 155 160

Asp Gly Lys Lys Val Leu Ala Ala Phe Glu Ala Pro Glu Ser Gln Ala
 165 170 175

Arg Ala Ala Gln Met Glu Glu Leu Thr Asn Lys Phe Gln Ile Ser Gly
 180 185 190

Thr Pro Thr Val Ile Val Gly Gly Lys Tyr Gln Val Glu Phe Lys Asp
 195 200 205

Trp Gln Ser Gly Met Thr Thr Ile Asp Gln Leu Val Asp Lys Val Arg
 210 215 220

Glu Glu Gln Lys Lys Pro Gln
 225 230

<210> 15

<211> 696

<212> DNA

<213> Neisseria meningitidis

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<212> PRT

<213> Neisseria meningitidis

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 20 25 30

Gln Ser Ser Ser Ser Ala Pro Ala Ala Pro Ala Glu Leu Asn Glu Gly
 35 40 45

Val Asn Tyr Thr Val Leu Ser Thr Pro Ile Pro Gln Gln Gln Ala Gly
 50 55 60

Lys Ile Glu Val Leu Glu Phe Phe Gly Tyr Phe Cys Pro His Cys Ala
 65 70 75 80

His Leu Glu Pro Val Leu Ser Glu His Ile Lys Thr Phe Lys Asp Asp
 85 90 95

Thr Tyr Met Arg Arg Glu His Val Val Trp Gly Asp Glu Met Lys Pro
 100 105 110

Leu Ala Arg Leu Ala Ala Ala Val Glu Met Ala Gly Glu Ser Asp Lys
 115 120 125

Ala Asn Ser His Ile Phe Asp Ala Met Val Asn Gln Lys Ile Asn Leu
 130 135 140

Ala Asp Thr Asp Thr Leu Lys Lys Trp Leu Ser Glu Gln Thr Ala Phe
 145 150 155 160

Asp Gly Lys Lys Val Leu Ala Ala Phe Glu Ala Pro Glu Ser Gln Ala
 165 170 175

Arg Ala Ala Gln Met Glu Glu Leu Thr Asn Lys Phe Gln Ile Ser Gly
 180 185 190

Thr Pro Thr Val Ile Val Gly Gly Lys Tyr Gln Val Glu Phe Lys Asp

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195

200

205

Trp Gln Ser Gly Met Thr Thr Ile Asp Gln Leu Val Asp Lys Val Arg
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Glu Glu Gln Lys Lys Pro Gln
 225 230

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<212> DNA

<213> *Neisseria meningitidis*

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 aaataccaag ttgaatttaa agactggcag tctggtatga ccacgattga ccagttggtg 660
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<210> 18

<211> 231

<212> PRT

<213> *Neisseria meningitidis*

<400> 18

Met Lys Leu Lys Thr Leu Ala Leu Thr Ser Leu Thr Leu Leu Ala Leu
 1 5 10 15

Ala Ala Cys Ser Lys Gln Ala Glu Thr Ser Val Pro Ala Asp Ser Ala
 20 25 30

Gln Ser Ser Ser Ser Ala Pro Ala Ala Pro Ala Glu Leu Asn Glu Gly
 35 40 45

Val Asn Tyr Thr Val Leu Ser Thr Pro Ile Pro Gln Gln Gln Ala Gly
 50 55 60

Lys Ile Glu Val Leu Glu Phe Phe Gly Tyr Phe Cys Pro His Cys Ala
 65 70 75 80

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His Leu Glu Pro Val Leu Ser Glu His Ile Lys Thr Phe Lys Asp Asp
85 90 95

Thr Tyr Met Arg Arg Glu His Val Val Trp Gly Asp Glu Met Lys Pro
100 105 110

Leu Ala Arg Leu Ala Ala Ala Val Glu Met Ala Gly Glu Ser Asp Lys
115 120 125

Ala Asn Ser His Ile Phe Asp Ala Met Val Asn Gln Lys Ile Asn Leu
130 135 140

Ala Asp Thr Asp Thr Leu Lys Lys Trp Leu Ser Glu Gln Thr Ala Phe
145 150 155 160

Asp Gly Lys Lys Val Leu Ala Ala Phe Glu Ala Pro Glu Ser Gln Ala
165 170 175

Arg Ala Ala Gln Met Glu Glu Leu Thr Asn Lys Phe Gln Ile Ser Gly
180 185 190

Thr Pro Thr Val Ile Val Gly Gly Lys Tyr Gln Val Glu Phe Lys Asp
195 200 205

Trp Gln Ser Gly Met Thr Thr Ile Asp Gln Leu Val Asp Lys Val Arg
210 215 220

Glu Glu Gln Lys Lys Pro Gln
225 230

<210> 19

<211> 696

<212> DNA

<213> Neisseria meningitidis

<400> 19

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 gataaagtac gcgaagagca gaaaaagccg caataa 696

<210> 20

<211> 231

<212> PRT

<213> Neisseria meningitidis

<400> 20

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Ala Ala Cys Ser Lys Gln Ala Glu Thr Ser Val Pro Ala Asp Ser Ala
 20 25 30

Gln Ser Ser Ser Ser Ala Pro Ala Ala Pro Ala Glu Leu Asn Glu Gly
 35 40 45

Val Asn Tyr Thr Val Leu Ser Thr Pro Ile Pro Gln Gln Gln Ala Gly
 50 55 60

Lys Ile Glu Val Leu Glu Phe Phe Gly Tyr Phe Cys Pro His Cys Ala
 65 70 75 80

His Leu Glu Pro Val Leu Ser Glu His Ile Lys Thr Phe Lys Asp Asp
 85 90 95

Thr Tyr Met Arg Arg Glu His Val Val Trp Gly Asp Glu Met Lys Pro
 100 105 110

Leu Ala Arg Leu Ala Ala Ala Val Glu Met Ala Gly Glu Ser Asp Lys
 115 120 125

Ala Asn Ser His Ile Phe Asp Ala Met Val Asn Gln Lys Ile Asn Leu
 130 135 140

Ala Asp Thr Asp Thr Leu Lys Lys Trp Leu Ser Glu Gln Thr Ala Phe
 145 150 155 160

Asp Gly Lys Lys Val Leu Ala Ala Phe Glu Ala Pro Glu Ser Gln Ala
 165 170 175

Arg Ala Ala Gln Met Glu Glu Leu Thr Asn Lys Phe Gln Ile Ser Gly
 180 185 190

Thr Pro Thr Val Ile Val Gly Gly Lys Tyr Gln Val Glu Phe Lys Asp
 195 200 205

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Trp Gln Ser Gly Met Thr Thr Ile Asp Gln Leu Val Asp Lys Val Arg
 210 215 220

Glu Glu Gln Lys Lys Pro Gln
 225 230

<210> 21

<211> 696

<212> DNA

<213> Neisseria meningitidis

<400> 21

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 aaaatcaatc tggccgatac cgataccctg aaaaaatggc tgtccgagca aacagcgttt 480
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 atggaagagt tgaccaataa attccaaatc agcggcacac cgactgtgat cgtcggcggc 600
 aaataccaag ttgaatttaa agactggcag tccggtatga ccacgattga ccagttgggtg 660
 gataaagtac gcgaagagca gaaaaagccg caataa 696

<210> 22

<211> 231

<212> PRT

<213> Neisseria meningitidis

<400> 22

Met Lys Leu Lys Thr Leu Ala Leu Thr Ser Leu Thr Leu Leu Ala Leu
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Ala Ala Cys Ser Lys Gln Ala Glu Thr Ser Val Pro Ala Asp Ser Val
 20 25 30

Gln Ser Ser Ser Ser Ala Pro Ala Ala Pro Ala Pro Leu Thr Glu Gly
 35 40 45

Val Asn Tyr Thr Val Leu Ser Thr Pro Ile Pro Gln Gln Gln Ala Gly
 50 55 60

Lys Val Glu Val Leu Glu Phe Phe Gly Tyr Phe Cys Pro His Cys Ala
 65 70 75 80

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696

<210> 24

<211> 231

<212> PRT

<213> Neisseria meningitidis

<400> 24

Met Lys Leu Lys Thr Leu Ala Leu Thr Ser Leu Thr Leu Leu Ala Leu
 1 5 10 15

Ala Ala Cys Ser Lys Gln Ala Glu Thr Ser Val Pro Ala Asp Ser Val
 20 25 30

Gln Ser Ser Ser Ser Ala Pro Ala Ala Pro Ala Pro Leu Thr Glu Gly
 35 40 45

Val Asn Tyr Thr Val Leu Ser Thr Pro Ile Pro Gln Gln Gln Ala Gly
 50 55 60

Lys Val Glu Val Leu Glu Phe Phe Gly Tyr Phe Cys Pro His Cys Ala
 65 70 75 80

His Leu Glu Pro Val Leu Ser Glu His Ile Lys Thr Phe Lys Asp Asp
 85 90 95

Thr Tyr Met Arg Arg Glu His Val Val Trp Gly Asp Glu Met Lys Pro
 100 105 110

Leu Ala Arg Leu Ala Ala Ala Val Glu Met Ala Gly Glu Ser Asp Lys
 115 120 125

Ala Asn Ser His Ile Phe Asp Ala Met Val Asn Gln Lys Ile Asn Leu
 130 135 140

Ala Asp Thr Asp Thr Leu Lys Lys Trp Leu Ser Glu Gln Thr Ala Phe
 145 150 155 160

Asp Gly Lys Lys Val Leu Ala Ala Phe Glu Ala Ser Glu Ser Gln Ala
 165 170 175

Arg Ala Ala Gln Met Glu Glu Leu Thr Asn Lys Phe Gln Ile Ser Gly
 180 185 190

Thr Pro Thr Val Ile Val Gly Gly Lys Tyr Gln Val Glu Phe Lys Asp
 195 200 205

Trp Gln Ser Gly Met Thr Thr Ile Asp Gln Leu Val Asp Lys Val Arg

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210

215

220

Glu Glu Gln Lys Lys Pro Gln

225

230

<210> 25

<211> 696

<212> DNA

<213> Neisseria meningitidis

<400> 25

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aaataccaag ttgaatttaa agactggcag tccggtatga ccacgattga ccagttgggtg 660
gataaagtac gcgaagagca gaaaaagccg caataa 696

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<210> 26

<211> 231

<212> PRT

<213> Neisseria meningitidis

<400> 26

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Met Lys Leu Lys Thr Leu Ala Leu Thr Ser Leu Thr Leu Leu Ala Leu
  1             5             10             15

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Ala Ala Cys Ser Lys Gln Ala Glu Thr Ser Val Pro Ala Asp Ser Val
      20             25             30

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Gln Ser Ser Ser Ser Ala Pro Ala Ala Pro Ala Pro Leu Thr Glu Gly
      35             40             45

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Val Asn Tyr Thr Val Leu Ser Thr Pro Ile Pro Gln Gln Gln Ala Gly
      50             55             60

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Lys Val Glu Val Leu Glu Phe Phe Gly Tyr Phe Cys Pro His Cys Ala
      65             70             75             80

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His Leu Glu Pro Val Leu Ser Glu His Ile Lys Thr Phe Lys Asp Asp
      85             90             95

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Thr Tyr Met Arg Arg Glu His Val Val Trp Gly Asp Glu Met Lys Pro
 100 105 110
 Leu Ala Arg Leu Ala Ala Ala Val Glu Met Ala Gly Glu Ser Asp Lys
 115 120 125
 Ala Asn Ser His Ile Phe Asp Ala Met Val Asn Gln Lys Ile Asn Leu
 130 135 140
 Ala Asp Thr Asp Thr Leu Lys Lys Trp Leu Ser Glu Gln Thr Ala Phe
 145 150 155 160
 Asp Gly Lys Lys Val Leu Ala Ala Phe Glu Ala Pro Glu Ser Gln Ala
 165 170 175
 Arg Ala Ala Gln Met Glu Glu Leu Thr Asn Lys Phe Gln Ile Ser Gly
 180 185 190
 Thr Pro Thr Val Ile Val Gly Gly Lys Tyr Gln Val Glu Phe Lys Asp
 195 200 205
 Trp Gln Ser Gly Met Thr Thr Ile Asp Gln Leu Val Asp Lys Val Arg
 210 215 220
 Glu Glu Gln Lys Lys Pro Gln
 225 230

<210> 27

<211> 1047

<212> DNA

<213> Neisseria meningitidis

<400> 27

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 aataacacct tatcgaaagc ctatcaaaca ttgagtcggt atgattcttt tgattacaaa 360
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<210> 28

<211> 348

<212> PRT

<213> Neisseria meningitidis

<400> 28

Glu Tyr Ala Leu Arg Glu Lys Leu Ile Lys Lys Ala Lys Gly Lys Gly
 1 5 10 15

Leu Leu Ser Leu Asp Trp Gly Ser Leu Thr Glu Gln Glu Ala Arg Gln
 20 25 30

Phe Ile Tyr Leu Ile Glu Lys Asp Arg Tyr Ser Asn Gln Leu Leu Asp
 35 40 45

Arg Tyr Gln Lys Asn Pro Ser Ser Leu Asn Asn Gln Glu Lys Asn Ile
 50 55 60

Leu Ala Tyr Phe Ile Asn Gln Thr Ser Gly Gly Asn Thr Ala Trp Ala
 65 70 75 80

Ala Ser Ile Leu Lys Thr Pro Gln Ser Met Gly Asn Leu Thr Ile Pro
 85 90 95

Ser Lys Asp Ile Asn Asn Thr Leu Ser Lys Ala Tyr Gln Thr Leu Ser
 100 105 110

Arg Tyr Asp Ser Phe Asp Tyr Lys Ser Ala Val Ala Ala Gln Pro Ala
 115 120 125

Leu Tyr Leu Leu Asn Gly Pro Leu Gly Phe Ser Val Lys Ala Ala Thr
 130 135 140

Val Ala Ala Gly Gly Tyr Asn Ile Gly Gln Gly Ala Lys Ala Ile Ser
 145 150 155 160

Asn Gly Glu Tyr Leu His Gly Thr Val Gln Val Val Asn Gly Thr Leu
 165 170 175

Met Val Ala Gly Ser Val Ser Ala Gln Ala Ala Ile Ser Ala Lys Pro
 180 185 190

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Ala Pro Val Thr Arg Tyr Leu Ser Asn Asp Ser Ala Pro Ala Leu Arg
 195 200 205

Gln Ala Leu Thr Ala Glu Ser Gln Arg Ile Arg Met Lys Leu Pro Glu
 210 215 220

Glu Tyr Arg Gln Ile Gly Asn Leu Ala Ile Ala Lys Ile Asp Val Lys
 225 230 235 240

Gly Leu Pro Gln Arg Met Glu Ala Phe Ser Ser Phe Gln Lys Gly Glu
 245 250 255

His Gly Phe Ile Ser Leu Pro Glu Thr Lys Ile Phe Lys Pro Ile Ser
 260 265 270

Val Asp Lys Tyr His Asn Ile Ala Ser Pro Pro Arg Gly Thr Leu Arg
 275 280 285

Asn Ile Asp Gly Glu Tyr Lys Leu Leu Glu Thr Ile Ala Gln Gln Leu
 290 295 300

Gly Asn Asn Arg Asn Val Ser Gly Arg Ile Asp Leu Phe Thr Glu Leu
 305 310 315 320

Lys Ala Cys Gln Ser Cys Ser Asn Val Ile Leu Glu Phe Arg Asn Arg
 325 330 335

Tyr Pro Asn Ile Gln Leu Asn Ile Phe Thr Gly Lys
 340 345

<210> 29

<211> 2112

<212> DNA

<213> Neisseria meningitidis

<400> 29

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<210> 30

<211> 703

<212> PRT

<213> Neisseria meningitidis

<400> 30

Met Lys Ile Ser Phe His Leu Ala Leu Leu Pro Thr Leu Ile Ile Ala

1

5

10

15

Ser Phe Pro Val Ala Ala Ala Asp Thr Gln Asp Asn Gly Glu His Tyr

20

25

30

Thr Ala Thr Leu Pro Thr Val Ser Val Val Gly Gln Ser Asp Thr Ser

35

40

45

Val Leu Lys Gly Tyr Ile Asn Tyr Asp Glu Ala Ala Val Thr Arg Asn

50

55

60

Gly Gln Leu Ile Lys Glu Thr Pro Gln Thr Ile Asp Thr Leu Asn Ile

65

70

75

80

Gln Lys Asn Lys Asn Tyr Gly Thr Asn Asp Leu Ser Ser Ile Leu Glu

24

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340	345	350
Asp Tyr Thr Ile Gly Arg Phe Glu Asn His Leu Thr Val Gly Met Asp		
355	360	365
Tyr Ser Arg Glu His Arg Asn Pro Thr Leu Gly Phe Ser Ser Ala Phe		
370	375	380
Ser Ala Ser Ile Asn Pro Tyr Asp Arg Ala Ser Trp Pro Ala Ser Gly		
385	390	395 400
Arg Leu Gln Pro Ile Leu Thr Gln Asn Arg His Lys Ala Asp Ser Tyr		
405	410	415
Gly Ile Phe Val Gln Asn Ile Phe Ser Ala Thr Pro Asp Leu Lys Phe		
420	425	430
Val Leu Gly Gly Arg Tyr Asp Lys Tyr Thr Phe Asn Ser Glu Asn Lys		
435	440	445
Leu Thr Gly Ser Ser Arg Gln Tyr Ser Gly His Ser Phe Ser Pro Asn		
450	455	460
Ile Gly Ala Val Trp Asn Ile Asn Pro Val His Thr Leu Tyr Ala Ser		
465	470	475 480
Tyr Asn Lys Gly Phe Ala Pro Tyr Gly Gly Arg Gly Gly Tyr Leu Ser		
485	490	495
Ile Asp Thr Leu Ser Ser Ala Val Phe Asn Ala Asp Pro Glu Tyr Thr		
500	505	510
Arg Gln Tyr Glu Thr Gly Val Lys Ser Ser Trp Leu Asp Asp Arg Leu		
515	520	525
Ser Thr Thr Leu Ser Ala Tyr Gln Ile Glu Arg Phe Asn Ile Arg Tyr		
530	535	540
Arg Pro Asp Pro Lys Asn Asn Pro Tyr Ile Tyr Ala Val Ser Gly Lys		
545	550	555 560
His Arg Ser Arg Gly Val Glu Leu Ser Ala Ile Gly Gln Ile Ile Pro		
565	570	575
Lys Lys Leu Tyr Leu Arg Gly Ser Leu Gly Val Met Gln Ala Lys Val		
580	585	590
Val Glu Asp Lys Glu Asn Pro Asp Arg Val Gly Ile His Leu Asn Asn		

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595	600	605
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Tyr Asp Ser Arg Asn Lys Glu Val Thr Thr Leu Pro Gly Phe Ala Arg		
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Val Asp Ala Met Leu Gly Trp Asn His Lys Asn Val Asn Val Thr Phe		
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Ala Ala Ala Asn Leu Phe Asn Gln Lys Tyr Trp Arg Ser Asp Ser Met		
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<210> 31

<211> 2113

<212> DNA

<213> Neisseria meningitidis

<400> 31

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```

<210> 32

<211> 697

<212> PRT

<213> Neisseria meningitidis

<400> 32

Met Lys Ile Ser Phe His Leu Ala Leu Leu Pro Thr Leu Ile Ile Ala

1

5

10

15

Ser Phe Pro Val Ala Ala Ala Asp Thr Gln Asp Asn Gly Glu His Tyr

20

25

30

Thr Ala Thr Leu Pro Thr Val Ser Val Val Gly Gln Ser Asp Thr Ser

35

40

45

Val Leu Lys Gly Tyr Ile Asn Tyr Asp Glu Ala Ala Val Thr Arg Asn

50

55

60

Gly Gln Leu Ile Lys Glu Thr Pro Gln Thr Ile Asp Thr Leu Asn Ile

65

70

75

80

Gln Lys Asn Lys Asn Tyr Gly Thr Asn Asp Leu Ser Ser Ile Leu Glu

85

90

95

Gly Asn Ala Gly Ile Asp Ala Ala Tyr Asp Met Arg Gly Glu Ser Ile

100

105

110

Phe Leu Arg Gly Phe Gln Ala Asp Ala Ser Asp Ile Tyr Arg Asp Gly

115

120

125

Val Arg Glu Ser Gly Gln Val Arg Arg Ser Thr Ala Asn Ile Glu Arg

130

135

140

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Val Glu Ile Leu Lys Gly Pro Ser Ser Val Leu Tyr Gly Arg Thr Asn
 145 150 155 160

Gly Gly Gly Val Ile Asn Met Val Ser Lys Tyr Ala Asn Phe Lys Gln
 165 170 175

Ser Arg Asn Ile Gly Thr Val Tyr Gly Ser Trp Ala Asn Arg Ser Leu
 180 185 190

Asn Met Asp Ile Asn Glu Val Leu Asn Lys Asn Val Ala Ile Arg Leu
 195 200 205

Thr Gly Glu Val Gly Arg Ala Asn Ser Phe Arg Ser Gly Ile Asp Ser
 210 215 220

Lys Asn Val Met Val Ser Pro Ser Ile Thr Val Lys Leu Asp Asn Gly
 225 230 235 240

Leu Lys Trp Thr Gly Gln Tyr Thr Tyr Asp Asn Val Glu Arg Thr Pro
 245 250 255

Asp Arg Ser Pro Thr Lys Ser Val Tyr Asp Arg Phe Gly Leu Pro Tyr
 260 265 270

Arg Met Gly Phe Ala His Arg Asn Asp Phe Val Lys Asp Lys Leu Gln
 275 280 285

Val Trp Arg Ser Asp Leu Glu Tyr Ala Phe Asn Asp Lys Trp Arg Ala
 290 295 300

Gln Trp Gln Leu Ala His Arg Thr Ala Ala Gln Asp Phe Asp His Phe
 305 310 315 320

Tyr Ala Gly Ser Glu Asn Gly Asn Leu Ile Lys Arg Asn Tyr Ala Trp
 325 330 335

Gln Gln Thr Asp Asn Lys Thr Leu Ser Ser Asn Leu Thr Leu Asn Gly
 340 345 350

Asp Tyr Thr Ile Gly Arg Phe Glu Asn His Leu Thr Val Gly Met Asp
 355 360 365

Tyr Ser Arg Glu His Arg Asn Pro Thr Leu Gly Phe Ser Ser Ala Phe
 370 375 380

Ser Ala Ser Ile Asn Pro Tyr Asp Arg Ala Ser Trp Pro Ala Ser Gly
 385 390 395 400

29

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Ala Trp Leu Glu Pro Lys Cys Arg Tyr Leu Cys Arg Ser Gln Ser Val
 660 665 670

Gln Ser Lys Ile Leu Ala Phe Gly Leu Tyr Ala Gly Ser Ala Arg Leu
 675 680 685

Tyr Cys Pro Gly Lys Leu Pro Phe Leu
 690 695

<210> 33

<211> 2111

<212> DNA

<213> *Neisseria meningitidis*

<400> 33

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```

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PCT/EP00/06943

```

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```

<210> 34

<211> 700

<212> PRT

<213> Neisseria meningitidis

<400> 34

```

Met Lys Ile Ser Phe His Leu Ala Leu Leu Pro Thr Leu Ile Ile Ala
  1              5              10              15

```

```

Ser Phe Pro Val Ala Ala Ala Asp Thr Gln Asp Asn Gly Glu His Tyr
      20              25              30

```

```

Thr Ala Thr Leu Pro Thr Val Ser Val Val Gly Gln Ser Asp Thr Ser
      35              40              45

```

```

Val Leu Lys Gly Tyr Ile Asn Tyr Asp Glu Ala Ala Val Thr Arg Asn
      50              55              60

```

```

Gly Gln Leu Ile Lys Glu Thr Pro Gln Thr Ile Asp Thr Leu Asn Ile
      65              70              75              80

```

```

Gln Lys Asn Lys Asn Tyr Gly Thr Asn Asp Leu Ser Ser Ile Leu Glu
      85              90              95

```

```

Gly Asn Ala Gly Ile Asp Ala Ala Tyr Asp Met Arg Gly Glu Ser Ile
      100             105             110

```

```

Phe Leu Arg Gly Phe Gln Ala Asp Ala Ser Asp Ile Tyr Arg Asp Gly
      115             120             125

```

```

Val Arg Glu Ser Gly Gln Val Arg Arg Ser Thr Ala Asn Ile Glu Arg
      130             135             140

```

```

Val Glu Ile Leu Lys Gly Pro Ser Ser Val Leu Tyr Gly Arg Thr Asn
      145             150             155             160

```

```

Gly Gly Gly Val Ile Asn Met Val Ser Lys Tyr Ala Asn Phe Lys Gln
      165             170             175

```

```

Ser Arg Asn Ile Gly Ala Val Tyr Gly Ser Arg Ala Asn Arg Ser Leu
      180             185             190

```

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Asn Met Asp Ile Asn Glu Val Leu Asn Lys Asn Val Ala Ile Arg Leu		
195	200	205
Thr Gly Glu Val Gly Arg Ala Asn Ser Phe Arg Ser Gly Ile Asp Ser		
210	215	220
Lys Asn Val Met Val Ser Pro Ser Ile Thr Val Lys Leu Asp Asn Gly		
225	230	235 240
Leu Lys Trp Thr Gly Gln Tyr Thr Tyr Asp Asn Val Glu Arg Thr Pro		
	245	250 255
Asp Arg Ser Pro Thr Lys Ser Val Tyr Asp Arg Phe Gly Leu Pro Tyr		
	260	265 270
Arg Met Gly Phe Ala His Arg Asn Asp Phe Val Lys Asp Lys Leu Gln		
	275	280 285
Val Trp Arg Ser Asp Leu Glu Tyr Ala Phe Asn Asp Lys Trp Arg Ala		
	290	295 300
Gln Trp Gln Leu Ala His Arg Thr Ala Ala Gln Asp Phe Asp His Phe		
305	310	315 320
Tyr Ala Gly Ser Glu Asn Gly Asn Leu Ile Lys Arg Asn Tyr Ala Trp		
	325	330 335
Gln Gln Thr Asp Asn Lys Thr Leu Ser Ser Asn Phe Thr Leu Asn Gly		
	340	345 350
Asp Tyr Thr Ile Gly Arg Phe Glu Asn His Leu Thr Val Gly Met Asp		
	355	360 365
Tyr Ser Arg Glu His Arg Asn Pro Thr Leu Gly Tyr Ser Arg Ala Phe		
	370	375 380
Thr Ala Ser Ile Asp Pro Tyr Asp Arg Ala Ser Trp Pro Ala Ser Gly		
385	390	395 400
Arg Leu Gln Pro Ile Leu Thr Gln Asn Arg His Lys Ala Asp Ser Tyr		
	405	410 415
Gly Ile Phe Val Gln Asn Ile Phe Ser Ala Thr Pro Asp Leu Lys Phe		
	420	425 430
Val Leu Gly Gly Arg Tyr Asp Lys Tyr Thr Phe Asn Ser Glu Asn Lys		
	435	440 445

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Leu Thr Gly Ser Ser Arg Gln Tyr Ser Gly His Ser Phe Ser Pro Asn
 450 455 460

Ile Gly Ala Val Trp Asn Ile Asn Pro Val His Thr Leu Tyr Ala Ser
 465 470 475 480

Tyr Asn Lys Gly Phe Ala Pro Tyr Gly Gly Arg Gly Gly Tyr Leu Ser
 485 490 495

Ile Asp Thr Ser Ser Ser Ala Val Phe Asn Ala Asp Pro Glu Tyr Thr
 500 505 510

Arg Gln Tyr Glu Thr Gly Val Lys Ser Ser Trp Leu Asp Asn Arg Leu
 515 520 525

Asp Thr Thr Leu Ser Ala Tyr Gln Ile Glu Arg Phe Asn Ile Arg Tyr
 530 535 540

Arg Pro Asp Ala Glu Asn Asn Pro Tyr Thr Trp Ala Val Gly Gly Lys
 545 550 555 560

His Arg Ser Arg Gly Val Glu Leu Ser Ala Ile Gly Gln Ile Ile Pro
 565 570 575

Lys Lys Leu Tyr Leu Arg Gly Ser Leu Gly Val Met Gln Ala Lys Val
 580 585 590

Val Glu Asp Lys Lys Asn Pro Asp Arg Val Gly Ile His Leu Asn Asn
 595 600 605

Thr Ser Asn Val Thr Gly Asn Leu Phe Phe Arg Tyr Thr Arg Pro Lys
 610 615 620

Thr Ser Thr Ala Lys Ser Ala Pro Val Gln Ala Asn Ala Thr Val Thr
 625 630 635 640

Thr Gln Glu Ile Lys Lys Leu Arg Phe Gln Ala Leu Pro Glu Leu Met
 645 650 655

Pro Cys Leu Ala Gly Thr Ile Lys Met Leu Thr Leu Pro Leu Pro Gln
 660 665 670

Pro Ile Cys Ser Ile Lys Asn Ile Gly Val Arg Thr Leu Cys Arg Val
 675 680 685

Ile Arg Ala Ala Ile Leu Pro Gly Ile Thr Val Ser
 690 695 700

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<210> 35

<211> 2112

<212> DNA

<213> *Neisseria meningitidis*

<400> 35

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tacagtttct aa 2112

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<210> 36

<211> 703

<212> PRT

<213> *Neisseria meningitidis*

WO 01/04150

PCT/EP00/06943

<400> 36

Met Lys Ile Ser Phe His Leu Ala Leu Leu Pro Thr Leu Ile Ile Ala
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Ser Phe Pro Val Ala Ala Ala Asp Thr Gln Asp Asn Gly Glu His Tyr
 20 25 30

Thr Ala Thr Leu Pro Thr Val Ser Val Val Gly Gln Ser Asp Thr Ser
 35 40 45

Val Leu Lys Gly Tyr Ile Asn Tyr Asp Glu Ala Ala Val Thr Arg Asn
 50 55 60

Gly Gln Leu Ile Lys Glu Thr Pro Gln Thr Ile Asp Thr Leu Asn Ile
 65 70 75 80

Gln Lys Asn Lys Asn Tyr Gly Thr Asn Asp Leu Ser Ser Ile Leu Glu
 85 90 95

Gly Asn Ala Gly Ile Asp Ala Ala Tyr Asp Met Arg Gly Glu Ser Ile
 100 105 110

Phe Leu Arg Gly Phe Gln Ala Asp Ala Ser Asp Ile Tyr Arg Asp Gly
 115 120 125

Val Arg Glu Ser Gly Gln Val Arg Arg Ser Thr Ala Asn Ile Glu Arg
 130 135 140

Val Glu Ile Leu Lys Gly Pro Ser Ser Val Leu Tyr Gly Arg Thr Asn
 145 150 155 160

Gly Gly Gly Val Ile Asn Met Val Ser Lys Tyr Ala Asn Phe Lys Gln
 165 170 175

Ser Arg Asn Ile Gly Ala Val Tyr Gly Ser Trp Ala Asn Arg Ser Leu
 180 185 190

Asn Met Asp Ile Asn Glu Val Leu Asn Lys Asn Val Ala Ile Arg Leu
 195 200 205

Thr Gly Glu Val Gly Arg Ala Asn Ser Phe Arg Ser Gly Ile Asp Ser
 210 215 220

Lys Asn Val Met Val Ser Pro Ser Ile Thr Val Lys Leu Asp Asn Gly
 225 230 235 240

Leu Lys Trp Thr Gly Gln Tyr Thr Tyr Asp Asn Val Glu Arg Thr Pro

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500	505	510
Arg Gln Tyr Glu Thr Gly Val Lys Ser Ser Trp Leu Asp Asp Arg Leu		
515	520	525
Ser Thr Thr Leu Ser Ala Tyr Gln Ile Glu Arg Phe Asn Ile Arg Tyr		
530	535	540
Arg Pro Asp Glu Gln Asn Asp Pro Tyr Thr Trp Ala Val Gly Gly Lys		
545	550	555
His Arg Ser Arg Gly Val Glu Leu Ser Ala Ile Gly Gln Ile Ile Pro		
565	570	575
Lys Lys Leu Tyr Leu Arg Gly Ser Leu Gly Val Met Gln Ala Lys Val		
580	585	590
Val Glu Asp Lys Glu Asn Pro Asp Arg Val Gly Ile His Leu Asn Asn		
595	600	605
Thr Ser Asn Val Thr Gly Asn Leu Phe Phe Arg Tyr Thr Pro Thr Glu		
610	615	620
Asn Leu Tyr Gly Glu Ile Gly Val Thr Gly Thr Gly Lys Arg Tyr Gly		
625	630	635
Tyr Asn Ser Arg Asn Lys Glu Val Thr Thr Leu Pro Gly Phe Ala Arg		
645	650	655
Val Asp Ala Met Leu Gly Trp Asn His Lys Asn Val Asn Ile Thr Phe		
660	665	670
Ala Ala Ala Asn Leu Leu Asn Gln Lys Tyr Trp Arg Ser Asp Ala Met		
675	680	685
Pro Gly Ala Pro Arg Thr Tyr Thr Ala Arg Val Asn Tyr Ser Phe		
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<210> 37

<211> 2112

<212> DNA

<213> Neisseria meningitidis

<400> 37

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tacagtttct aa 2112

```

<210> 38

<211> 702

<212> PRT

<213> *Neisseria meningitidis*

<400> 38

Met Lys Ile Ser Phe His Leu Ala Leu Leu Pro Thr Leu Ile Ile Ala

1

5

10

15

Ser Phe Pro Val Ala Ala Ala Asp Thr Gln Asp Asn Gly Glu His Tyr

20

25

30

Thr Ala Thr Leu Pro Thr Val Ser Val Val Gly Gln Ser Asp Thr Ser

35

40

45

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Val Leu Lys Gly Tyr Ile Asn Tyr Asp Glu Ala Ala Val Thr Arg Asn
 50 55 60

Gly Gln Leu Ile Lys Glu Thr Pro Gln Thr Ile Asp Thr Leu Asn Ile
 65 70 75 80

Lys Asn Lys Asn Tyr Gly Thr Asn Asp Leu Ser Ser Ile Leu Glu Gly
 85 90 95

Asn Ala Gly Ile Asp Ala Ala Tyr Asp Met Arg Gly Glu Ser Ile Phe
 100 105 110

Leu Arg Gly Phe Gln Ala Asp Ala Ser Asp Ile Tyr Arg Asp Gly Val
 115 120 125

Arg Glu Ser Gly Gln Val Arg Arg Ser Thr Ala Asn Ile Glu Arg Val
 130 135 140

Glu Ile Leu Lys Gly Pro Ser Ser Val Leu Tyr Gly Arg Thr Asn Gly
 145 150 155 160

Gly Gly Val Ile Asn Met Val Ser Lys Tyr Ala Asn Phe Lys Gln Ser
 165 170 175

Arg Asn Ile Gly Ala Val Tyr Gly Ser Trp Ala Asn Arg Ser Leu Asn
 180 185 190

Met Asp Ile Asn Glu Val Leu Asn Lys Asn Val Ala Ile Arg Leu Thr
 195 200 205

Gly Glu Val Gly Arg Ala Asn Ser Phe Arg Ser Gly Ile Asp Ser Lys
 210 215 220

Asn Val Met Val Ser Pro Ser Ile Thr Val Lys Leu Asp Asn Gly Leu
 225 230 235 240

Lys Trp Thr Gly Gln Tyr Thr Tyr Asp Asn Val Glu Arg Thr Pro Asp
 245 250 255

Arg Ser Pro Thr Lys Ser Val Tyr Asp Arg Phe Gly Leu Pro Tyr Arg
 260 265 270

Met Gly Phe Ala His Arg Asn Asp Phe Val Lys Asp Lys Leu Gln Val
 275 280 285

Trp Arg Ser Asp Leu Glu Tyr Ala Phe Asn Asp Lys Trp Arg Ala Gln
 290 295 300

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Trp Gln Leu Ala His Arg Thr Ala Ala Gln Asp Phe Asp His Phe Tyr
 305 310 315 320

Ala Gly Ser Glu Asn Gly Asn Leu Ile Lys Arg Asn Tyr Ala Trp Gln
 325 330 335

Gln Thr Asp Asn Lys Thr Leu Ser Ser Asn Phe Thr Leu Asn Gly Asp
 340 345 350

Tyr Thr Ile Gly Arg Phe Glu Asn His Leu Thr Val Gly Met Asp Tyr
 355 360 365

Ser Arg Glu His Arg Asn Pro Thr Leu Gly Tyr Ser Arg Ala Phe Thr
 370 375 380

Ala Ser Ile Asp Pro Tyr Asp Arg Ala Ser Trp Pro Ala Ser Gly Arg
 385 390 395 400

Leu Gln Pro Ile Leu Thr Gln Asn Arg His Lys Ala Asp Ser Tyr Gly
 405 410 415

Ile Phe Val Gln Asn Ile Phe Ser Ala Thr Pro Asp Leu Lys Phe Val
 420 425 430

Leu Gly Gly Arg Tyr Asp Lys Tyr Thr Phe Asn Ser Glu Asn Lys Leu
 435 440 445

Thr Gly Ser Ser Arg Gln Tyr Ser Gly His Ser Phe Ser Pro Asn Ile
 450 455 460

Gly Ala Val Trp Asn Ile Asn Pro Val His Thr Leu Tyr Ala Ser Tyr
 465 470 475 480

Asn Lys Gly Phe Ala Pro Tyr Gly Gly Arg Gly Gly Tyr Leu Ser Ile
 485 490 495

Asn Thr Ser Ser Ser Ala Val Phe Asn Ala Asp Pro Glu Tyr Thr Arg
 500 505 510

Gln Tyr Glu Thr Gly Val Lys Ser Ser Trp Leu Asp Asp Arg Leu Ser
 515 520 525

Thr Thr Leu Ser Ala Tyr Gln Ile Glu Arg Phe Asn Ile Arg Tyr Arg
 530 535 540

Pro Asp Glu Gln Asn Asp Pro Tyr Thr Trp Ala Val Gly Gly Lys His
 545 550 555 560

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Arg Ser Arg Gly Val Glu Leu Ser Ala Ile Gly Gln Ile Ile Pro Lys
 565 570 575

Lys Leu Tyr Leu Arg Gly Ser Leu Gly Val Met Gln Ala Lys Val Val
 580 585 590

Glu Asp Lys Glu Asn Pro Asp Arg Val Gly Ile His Leu Asn Asn Thr
 595 600 605

Ser Asn Val Thr Gly Asn Leu Phe Phe Arg Tyr Thr Pro Thr Glu Asn
 610 615 620

Leu Tyr Gly Glu Ile Gly Val Thr Gly Thr Gly Lys Arg Tyr Gly Tyr
 625 630 635 640

Asn Ser Arg Asn Lys Glu Val Thr Thr Leu Pro Gly Phe Ala Arg Val
 645 650 655

Asp Ala Met Leu Gly Trp Asn His Lys Asn Val Asn Ile Thr Phe Ala
 660 665 670

Ala Ala Asn Leu Leu Asn Gln Lys Tyr Trp Arg Ser Asp Ala Met Pro
 675 680 685

Gly Ala Pro Arg Thr Tyr Thr Ala Arg Val Asn Tyr Ser Phe
 690 695 700

<210> 39

<211> 2112

<212> DNA

<213> Neisseria meningitidis

<400> 39

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gtggtcggac agtccgacac cagcgtactc aaaggctaca tcaactacga cgaagccgcc 180
gttaccgcga acggacagct catcaaagaa acgccgcaaa ccatcgatac gctcaatatc 240
tagaaaaaca aaaattacgg tacgaacgat ttgagttcca tcctcgaagg caatgccggc 300
atcgacgctg cctacgatat gcgcggcgaa agcattttcc tgcgcggttt tcaagccgac 360
gcatccgata tttaccgcga cggcgtgctc gaaagcggac aagtgcgccg cagtactgcc 420
aacatcgagc gcgtggaaat cctgaaaggc ccgtcttccg tgctttacgg ccgcaccaac 480
ggcggcgggc tcatcaacat ggtcagcaaa tacgccaact tcaaacaag ccgcaacatc 540
gggtgcggtt acggttcgtg ggcaaaccgc agcctgaata tggacattaa cgaagtgttg 600
aacaaaaacg tcgccatccg tctcaccggc gaagtcgggc gcgccaattc gttccgcagc 660
ggcatagaca gcaaaaatgt catggtttcg cccagcatta ccgtcaaact cgacaacggc 720
ttgaagtgga cggggcaata cacctacgac aatgtggagc gcacgcccga ccgcagtcgg 780

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accaagtccg tgtacgaccg cttcggactg ccttaccgca tgggggttcgc ccaccggaac 840
gattttgtca aagacaagct gcaagtttgg cgctccgacc ttgaatacgc cttcaacgac 900
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cttggtgga accataaaaa tgtaacgtt acctttgccg cagccaatct gttcaatcaa 2040
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taccgtttct ga 2112

```

<210> 40

<211> 702

<212> PRT

<213> Neisseria meningitidis

<400> 40

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Met Lys Ile Ser Phe His Leu Ala Leu Leu Pro Thr Leu Ile Ile Ala
  1                      5                      10                     15

```

```

Ser Phe Pro Val Ala Ala Ala Asp Thr Gln Asp Asn Gly Glu His Tyr
          20                      25                     30

```

```

Thr Ala Thr Leu Pro Thr Val Ser Val Val Gly Gln Ser Asp Thr Ser
      35                      40                     45

```

```

Val Leu Lys Gly Tyr Ile Asn Tyr Asp Glu Ala Ala Val Thr Arg Asn
      50                      55                     60

```

```

Gly Gln Leu Ile Lys Glu Thr Pro Gln Thr Ile Asp Thr Leu Asn Ile
      65                      70                     75                     80

```

```

Lys Asn Lys Asn Tyr Gly Thr Asn Asp Leu Ser Ser Ile Leu Glu Gly
          85                      90                     95

```

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Asn	Ala	Gly	Ile	Asp	Ala	Ala	Tyr	Asp	Met	Arg	Gly	Glu	Ser	Ile	Phe	100	105	110	
Leu	Arg	Gly	Phe	Gln	Ala	Asp	Ala	Ser	Asp	Ile	Tyr	Arg	Asp	Gly	Val	115	120	125	
Arg	Glu	Ser	Gly	Gln	Val	Arg	Arg	Ser	Thr	Ala	Asn	Ile	Glu	Arg	Val	130	135	140	
Glu	Ile	Leu	Lys	Gly	Pro	Ser	Ser	Val	Leu	Tyr	Gly	Arg	Thr	Asn	Gly	145	150	155	160
Gly	Gly	Val	Ile	Asn	Met	Val	Ser	Lys	Tyr	Ala	Asn	Phe	Lys	Gln	Ser	165	170	175	
Arg	Asn	Ile	Gly	Ala	Val	Tyr	Gly	Ser	Trp	Ala	Asn	Arg	Ser	Leu	Asn	180	185	190	
Met	Asp	Ile	Asn	Glu	Val	Leu	Asn	Lys	Asn	Val	Ala	Ile	Arg	Leu	Thr	195	200	205	
Gly	Glu	Val	Gly	Arg	Ala	Asn	Ser	Phe	Arg	Ser	Gly	Ile	Asp	Ser	Lys	210	215	220	
Asn	Val	Met	Val	Ser	Pro	Ser	Ile	Thr	Val	Lys	Leu	Asp	Asn	Gly	Leu	225	230	235	240
Lys	Trp	Thr	Gly	Gln	Tyr	Thr	Tyr	Asp	Asn	Val	Glu	Arg	Thr	Pro	Asp	245	250	255	
Arg	Ser	Pro	Thr	Lys	Ser	Val	Tyr	Asp	Arg	Phe	Gly	Leu	Pro	Tyr	Arg	260	265	270	
Met	Gly	Phe	Ala	His	Arg	Asn	Asp	Phe	Val	Lys	Asp	Lys	Leu	Gln	Val	275	280	285	
Trp	Arg	Ser	Asp	Leu	Glu	Tyr	Ala	Phe	Asn	Asp	Lys	Trp	Arg	Ala	Gln	290	295	300	
Trp	Gln	Leu	Ala	His	Arg	Thr	Ala	Ala	Gln	Asp	Phe	Asp	His	Phe	Tyr	305	310	315	320
Ala	Gly	Ser	Glu	Asn	Gly	Asn	Leu	Ile	Lys	Arg	Asn	Tyr	Ala	Trp	Gln	325	330	335	
Gln	Thr	Asp	Asn	Lys	Thr	Leu	Ser	Ser	Asn	Phe	Thr	Leu	Asn	Gly	Asp	340	345	350	

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Tyr Thr Ile Gly Arg Phe Glu Asn His Leu Thr Val Gly Met Asp Tyr
 355 360 365

Ser Arg Glu His Arg Asn Pro Thr Leu Gly Tyr Arg Gly Ser Phe Thr
 370 375 380

Val Pro Ile Asn Pro Tyr Asp Arg Ala Ser Trp Pro Ala Ser Gly Arg
 385 390 395 400

Leu Gln Pro Ile Leu Thr Gln Asn Arg His Lys Ala Asp Ser Tyr Gly
 405 410 415

Ile Phe Val Gln Asn Ile Phe Ser Ala Thr Pro Asp Leu Lys Phe Val
 420 425 430

Leu Gly Gly Arg Tyr Asp Lys Tyr Thr Phe Asn Ser Glu Asn Lys Leu
 435 440 445

Thr Gly Asn Ser Arg Gln Tyr Ser Gly His Ser Phe Ser Pro Asn Ile
 450 455 460

Gly Ala Val Trp Asn Ile Asn Pro Val His Thr Leu Tyr Ala Ser Tyr
 465 470 475 480

Asn Lys Gly Phe Ala Pro Tyr Gly Gly Arg Gly Gly Tyr Leu Ser Ile
 485 490 495

Asp Thr Leu Ser Ser Ala Val Phe Asn Ala Asp Pro Glu Tyr Thr Arg
 500 505 510

Gln Tyr Glu Thr Gly Val Lys Ser Ser Trp Leu Asp Asp Arg Leu Ser
 515 520 525

Thr Thr Leu Ser Ala Tyr Gln Ile Glu Arg Phe Asn Ile Arg Tyr Arg
 530 535 540

Pro Asp Pro Lys Asn Asn Pro Tyr Ile Tyr Ala Val Ser Gly Lys His
 545 550 555 560

Arg Ser Arg Gly Val Glu Leu Ser Ala Ile Gly Gln Ile Ile Pro Lys
 565 570 575

Lys Leu Tyr Leu Arg Gly Ser Leu Gly Val Met Gln Ala Lys Val Val
 580 585 590

Glu Asp Lys Glu Asn Pro Asp Arg Val Gly Ile His Leu Asn Asn Thr
 595 600 605

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Ser Asn Val Thr Gly Asn Leu Phe Phe Arg Tyr Thr Pro Thr Glu Asn
 610 615 620

Leu Tyr Gly Glu Ile Gly Val Thr Gly Thr Gly Lys Arg Tyr Gly Tyr
 625 630 635 640

Asn Ser Arg Asn Lys Glu Val Thr Thr Leu Pro Gly Phe Ala Arg Val
 645 650 655

Asp Ala Met Leu Gly Trp Asn His Lys Asn Val Asn Val Thr Phe Ala
 660 665 670

Ala Ala Asn Leu Phe Asn Gln Lys Tyr Trp Arg Ser Asp Ser Met Pro
 675 680 685

Gly Asn Pro Arg Gly Tyr Thr Ala Arg Val Asn Tyr Arg Phe
 690 695 700

<210> 41

<211> 2112

<212> DNA

<213> Neisseria meningitidis

<400> 41

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 gttacccgca acggacagct catcaaagaa acgccgcaaa ccatcgatac gctcaatatc 240
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 atcgacgctg cctacgatat gcgcggcgaa agcattttcc tgcgcggttt tcaagccgac 360
 gcatccgata tttaccgcga cggcgtgccc gaaagcggac aagtgcgccg cagtactgcc 420
 aacatcgagc gcgtggaaat cctgaaaggc ccgtcttccg tgctttacgg ccgcaccaac 480
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 ggtgcggttt acggttagtg ggcaaacccg agcctgaata tggacattaa cgaagtgtctg 600
 aacaaaaacg tcgccatccg tctcaccggc gaagtcgggc gcgccaattc gttccgcagc 660
 ggcatagaca gcaaaaatgt catggtttcg cccagcatta ccgtcaaact cgacaacggc 720
 ttgaagtga cggggcaata cacctacgac aatgtggagc gcacgcccga ccgcagtccg 780
 accaagtccg tgtacgaccg cttcggactg ccttaccgca tggggttcgc ccaccggaac 840
 gattttgtca aagacaagct gcaagtttg cgttccgacc ttgaatacgc cttcaacgac 900
 aaatggcgctg cccaatggca gctcgcccac cgcacggcgg cgcaggattt tgatcatttc 960
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 aaccgcgcct tttccgcctc catcaacccc tacgaccgcg caagctggcc ggcttcggggc 1200
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tacaccttta attccgaaaa caaactcacc ggcagcagcc gccaatagcg cggacactcg 1380
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tataacaaag gcttcgcgcc ttatggcgga cgcggcggtt atttgagcat cgatacgttg 1500
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taccgtttct ga                                     2112

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<210> 42

<211> 702

<212> PRT

<213> Neisseria meningitidis

<400> 42

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Met Lys Ile Ser Phe His Leu Ala Leu Leu Pro Thr Leu Ile Ile Ala
  1                      5                      10                      15

```

```

Ser Phe Pro Val Ala Ala Ala Asp Thr Gln Asp Asn Gly Glu His Tyr
                20                      25                      30

```

```

Thr Ala Thr Leu Pro Thr Val Ser Val Val Gly Gln Ser Asp Thr Ser
    35                      40                      45

```

```

Val Leu Lys Gly Tyr Ile Asn Tyr Asp Glu Ala Ala Val Thr Arg Asn
    50                      55                      60

```

```

Gly Gln Leu Ile Lys Glu Thr Pro Gln Thr Ile Asp Thr Leu Asn Ile
    65                      70                      75                      80

```

```

Gln Lys Asn Lys Asn Tyr Gly Thr Asn Asp Leu Ser Ser Ile Leu Glu
                85                      90                      95

```

```

Gly Asn Ala Gly Ile Asp Ala Ala Tyr Asp Met Arg Gly Glu Ser Ile
    100                      105                      110

```

```

Phe Leu Arg Gly Phe Gln Ala Asp Ala Ser Asp Ile Tyr Arg Asp Gly
    115                      120                      125

```

```

Val Arg Glu Ser Gly Gln Val Arg Arg Ser Thr Ala Asn Ile Glu Arg
    130                      135                      140

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Val	Glu	Ile	Leu	Lys	Gly	Pro	Ser	Ser	Val	Leu	Tyr	Gly	Arg	Thr	Asn	
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Gly	Gly	Gly	Val	Ile	Asn	Met	Val	Ser	Lys	Tyr	Ala	Asn	Phe	Lys	Gln	
			165						170					175		
Ser	Arg	Asn	Ile	Gly	Ala	Val	Tyr	Gly	Trp	Ala	Asn	Arg	Ser	Leu	Asn	
			180						185					190		
Met	Asp	Ile	Asn	Glu	Val	Leu	Asn	Lys	Asn	Val	Ala	Ile	Arg	Leu	Thr	
		195						200					205			
Gly	Glu	Val	Gly	Arg	Ala	Asn	Ser	Phe	Arg	Ser	Gly	Ile	Asp	Ser	Lys	
		210				215					220					
Asn	Val	Met	Val	Ser	Pro	Ser	Ile	Thr	Val	Lys	Leu	Asp	Asn	Gly	Leu	
225					230					235					240	
Lys	Trp	Thr	Gly	Gln	Tyr	Thr	Tyr	Asp	Asn	Val	Glu	Arg	Thr	Pro	Asp	
			245						250					255		
Arg	Ser	Pro	Thr	Lys	Ser	Val	Tyr	Asp	Arg	Phe	Gly	Leu	Pro	Tyr	Arg	
			260						265					270		
Met	Gly	Phe	Ala	His	Arg	Asn	Asp	Phe	Val	Lys	Asp	Lys	Leu	Gln	Val	
		275						280					285			
Trp	Arg	Ser	Asp	Leu	Glu	Tyr	Ala	Phe	Asn	Asp	Lys	Trp	Arg	Ala	Gln	
		290					295					300				
Trp	Gln	Leu	Ala	His	Arg	Thr	Ala	Ala	Gln	Asp	Phe	Asp	His	Phe	Tyr	
305					310					315					320	
Ala	Gly	Ser	Glu	Asn	Gly	Asn	Leu	Ile	Lys	Arg	Asn	Tyr	Ala	Trp	Gln	
				325					330					335		
Gln	Thr	Asp	Asn	Lys	Thr	Leu	Ser	Ser	Asn	Phe	Thr	Leu	Asn	Gly	Asp	
			340						345					350		
Tyr	Thr	Ile	Gly	Arg	Phe	Glu	Asn	His	Leu	Thr	Val	Gly	Met	Asp	Tyr	
		355						360					365			
Ser	Arg	Glu	His	Arg	Asn	Pro	Thr	Leu	Gly	Tyr	Asn	Arg	Ala	Phe	Ser	
		370						375				380				
Ala	Ser	Ile	Asn	Pro	Tyr	Asp	Arg	Ala	Ser	Trp	Pro	Ala	Ser	Gly	Arg	
385					390					395					400	

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Leu Gln Pro Ile Leu Thr Gln Asn Arg His Lys Ala Asp Ser Tyr Gly
 405 410 415

Ile Phe Val Gln Asn Ile Phe Ser Ala Thr Pro Asp Leu Lys Phe Val
 420 425 430

Leu Gly Gly Arg Tyr Asp Lys Tyr Thr Phe Asn Ser Glu Asn Lys Leu
 435 440 445

Thr Gly Ser Ser Arg Gln Tyr Ser Gly His Ser Phe Ser Pro Asn Ile
 450 455 460

Gly Ala Val Trp Asn Ile Asn Pro Val His Thr Leu Tyr Ala Ser Tyr
 465 470 475 480

Asn Lys Gly Phe Ala Pro Tyr Gly Gly Arg Gly Gly Tyr Leu Ser Ile
 485 490 495

Asp Thr Leu Ser Ser Ala Val Phe Asn Ala Asp Pro Glu Tyr Thr Arg
 500 505 510

Gln Tyr Glu Thr Gly Val Lys Ser Ser Trp Leu Asp Asp Arg Leu Ser
 515 520 525

Thr Thr Leu Ser Ala Tyr Gln Ile Glu Arg Phe Asn Ile Arg Tyr Arg
 530 535 540

Pro Asp Pro Lys Asn Asn Pro Tyr Ile Tyr Ala Val Ser Gly Lys His
 545 550 555 560

Arg Ser Arg Gly Val Glu Leu Ser Ala Ile Gly Gln Ile Ile Pro Lys
 565 570 575

Lys Leu Tyr Leu Arg Gly Ser Leu Gly Val Met Gln Ala Lys Val Val
 580 585 590

Glu Asp Lys Glu Asn Pro Asp Arg Val Gly Ile His Leu Asn Asn Thr
 595 600 605

Ser Asn Val Thr Gly Asn Leu Phe Phe Arg Tyr Thr Pro Thr Glu Asn
 610 615 620

Leu Tyr Gly Glu Ile Gly Val Thr Gly Thr Gly Lys Arg Tyr Gly Tyr
 625 630 635 640

Asp Ser Arg Asn Lys Glu Val Thr Thr Leu Pro Gly Phe Ala Arg Val
 645 650 655

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Asp Ala Met Leu Gly Trp Asn His Lys Asn Val Asn Val Thr Phe Ala
 660 665 670

Ala Ala Asn Leu Phe Asn Gln Lys Tyr Trp Arg Ser Asp Ser Met Pro
 675 680 685

Gly Asn Pro Arg Gly Tyr Thr Ala Arg Val Asn Tyr Arg Phe
 690 695 700

<210> 43

<211> 2109

<212> DNA

<213> Neisseria meningitidis

<400> 43

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gtggtcggac agtccgacac cagcgtactc aaaggctaca tcaactacga cgaagccgcc 180
gttaccgcga acggacagct catcaaagaa acgccgcaaa ccatcgatac gctcaatatc 240
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ccgactgaaa acctctacgg cgaaatcggc gtaaccggta caggcaaacg ctacggctac 1920

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 cgtttctga 2109

<210> 44

<211> 702

<212> PRT

<213> Neisseria meningitidis

<400> 44

Met Lys Ile Ser Phe His Leu Ala Leu Leu Pro Thr Leu Ile Ile Ala
 1 5 10 15

Ser Phe Pro Val Ala Ala Ala Asp Thr Gln Asp Asn Gly Glu His Tyr
 20 25 30

Thr Ala Thr Leu Pro Thr Val Ser Val Val Gly Gln Ser Asp Thr Ser
 35 40 45

Val Leu Lys Gly Tyr Ile Asn Tyr Asp Glu Ala Ala Val Thr Arg Asn
 50 55 60

Gly Gln Leu Ile Lys Glu Thr Pro Gln Thr Ile Asp Thr Leu Asn Ile
 65 70 75 80

Gln Lys Asn Lys Asn Tyr Gly Thr Asn Asp Leu Ser Ser Ile Leu Glu
 85 90 95

Gly Asn Ala Gly Ile Asp Ala Ala Tyr Asp Met Arg Gly Glu Ser Ile
 100 105 110

Phe Leu Arg Gly Phe Gln Ala Asp Ala Ser Asp Ile Tyr Arg Asp Gly
 115 120 125

Val Arg Glu Ser Gly Gln Val Arg Arg Ser Thr Ala Asn Ile Glu Arg
 130 135 140

Val Glu Ile Leu Lys Gly Pro Ser Ser Val Leu Tyr Gly Arg Thr Asn
 145 150 155 160

Gly Gly Gly Val Ile Asn Met Val Ser Lys Tyr Ala Asn Phe Lys Gln
 165 170 175

Ser Arg Asn Ile Gly Ala Val Tyr Gly Ser Trp Ala Asn Arg Ser Leu
 180 185 190

Asn Met Asp Ile Asn Glu Val Leu Asn Lys Asn Val Ala Ile Arg Leu

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195	200	205
Thr Gly Glu Val Gly Arg Ala Asn Ser Phe Arg Ser Gly Ile Asp Ser		
210	215	220
Lys Asn Val Met Val Ser Pro Ser Ile Thr Val Lys Leu Asp Asn Gly		
225	230	235 240
Leu Lys Trp Thr Gly Gln Tyr Thr Tyr Asp Asn Val Glu Arg Thr Pro		
	245	250 255
Asp Arg Ser Pro Thr Lys Ser Val Tyr Asp Arg Phe Gly Leu Pro Tyr		
	260	265 270
Arg Met Gly Phe Ala His Arg Asn Asp Phe Val Lys Asp Lys Leu Gln		
	275	280 285
Val Trp Arg Ser Asp Leu Glu Tyr Ala Phe Asn Asp Lys Trp Arg Ala		
	290	295 300
Gln Trp Gln Leu Ala His Arg Thr Ala Ala Gln Asp Phe Asp His Phe		
305	310	315 320
Tyr Ala Gly Ser Glu Asn Gly Asn Leu Ile Lys Arg Asn Tyr Ala Trp		
	325	330 335
Gln Gln Thr Asp Asn Lys Thr Leu Ser Ser Asn Leu Thr Leu Asn Gly		
	340	345 350
Asp Tyr Thr Ile Gly Arg Phe Glu Asn His Leu Thr Val Gly Met Asp		
	355	360 365
Tyr Ser Arg Glu His Arg Asn Pro Thr Leu Gly Tyr Arg Gly Ser Phe		
	370	375 380
Thr Val Pro Ile Asn Pro Tyr Asp Arg Ala Ser Trp Pro Ala Ser Gly		
385	390	395 400
Arg Leu Gln Pro Ile Leu Thr Gln Asn Arg His Lys Ala Asp Ser Tyr		
	405	410 415
Gly Ile Phe Val Gln Asn Ile Phe Ser Ala Thr Pro Asp Leu Lys Phe		
	420	425 430
Val Leu Gly Gly Arg Tyr Asp Lys Tyr Thr Phe Asn Ser Glu Asn Lys		
	435	440 445
Leu Thr Gly Asn Ser Arg Gln Tyr Ser Gly His Ser Phe Ser Pro Asn		

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450		455		460	
Ile Gly Ala Val Trp Asn Ile Asn Pro Val His Thr Leu Tyr Ala Ser					
465		470		475	480
Tyr Asn Lys Gly Phe Ala Pro Tyr Gly Gly Arg Gly Tyr Leu Ser Ile					
	485		490		495
Asp Thr Ser Ser Ala Ala Val Phe Asn Ala Ala Pro Glu Tyr Thr Arg					
	500		505		510
Gln Tyr Glu Thr Gly Val Lys Ser Ser Trp Leu Asp Asp Arg Leu Ser					
	515		520		525
Thr Thr Leu Ser Ala Tyr Gln Ile Glu Arg Phe Asn Ile Arg Tyr Arg					
	530		535		540
Pro Asp Pro Lys Asn Asn Pro Tyr Ile Tyr Ala Val Ser Gly Lys His					
545		550		555	560
Arg Ser Arg Gly Val Glu Leu Ser Ala Ile Gly Gln Ile Ile Pro Lys					
	565		570		575
Lys Leu Tyr Leu Arg Gly Ser Leu Gly Val Met Gln Ala Lys Val Val					
	580		585		590
Glu Asp Lys Glu Asn Pro Asp Arg Val Gly Ile His Leu Asn Asn Thr					
	595		600		605
Ser Asn Val Thr Gly Asn Leu Phe Phe Arg Tyr Thr Pro Thr Glu Asn					
	610		615		620
Leu Tyr Gly Glu Ile Gly Val Thr Gly Thr Gly Lys Arg Tyr Gly Tyr					
625		630		635	640
Asn Ser Arg Asn Lys Glu Val Thr Thr Leu Pro Gly Phe Ala Arg Val					
	645		650		655
Asp Ala Met Leu Gly Trp Asn His Lys Asn Val Asn Val Thr Phe Ala					
	660		665		670
Ala Ala Asn Leu Leu Asn Gln Lys Tyr Trp Arg Ser Asp Ser Met Pro					
	675		680		685
Gly Asn Pro Arg Gly Tyr Thr Ala Arg Val Asn Tyr Arg Phe					
690		695		700	

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<210> 45

<211> 2108

<212> DNA

<213> *Neisseria meningitidis*

<400> 45

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<210> 46

<211> 697

<212> PRT

<213> *Neisseria meningitidis*

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<400> 46

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Met Lys Ile Ser Phe His Leu Ala Leu Leu Pro Thr Leu Ile Ile Ala
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Ser Phe Pro Val Ala Ala Ala Asp Thr Gln Asp Asn Gly Glu His Tyr
          20              25              30

Thr Ala Thr Leu Pro Thr Val Ser Val Val Gly Gln Ser Asp Thr Ser
          35              40              45

Val Leu Lys Gly Tyr Ile Asn Tyr Asp Glu Ala Ala Val Thr Arg Asn
 50              55              60

Gly Gln Leu Ile Lys Glu Thr Pro Gln Thr Ile Asp Thr Leu Asn Ile
 65              70              75              80

Gln Lys Asn Lys Asn Tyr Gly Thr Asn Asp Leu Ser Ser Ile Leu Glu
          85              90              95

Gly Asn Ala Gly Ile Asp Ala Ala Tyr Asp Met Arg Gly Glu Ser Ile
          100              105              110

Phe Leu Arg Gly Phe Gln Ala Asp Ala Ser Asp Ile Tyr Arg Asp Gly
          115              120              125

Val Arg Glu Ser Gly Gln Val Arg Arg Ser Thr Ala Asn Ile Glu Arg
          130              135              140

Val Glu Ile Leu Lys Gly Pro Ser Ser Val Leu Tyr Gly Arg Thr Asn
          145              150              155              160

Gly Gly Gly Val Ile Asn Met Val Ser Lys Tyr Ala Asn Phe Lys Gln
          165              170              175

Ser Arg Asn Ile Gly Ala Val Tyr Gly Ser Trp Ala Asn Arg Ser Leu
          180              185              190

Asn Met Asp Ile Asn Glu Val Leu Asn Lys Asn Val Ala Ile Arg Leu
          195              200              205

Thr Gly Glu Val Gly Arg Ala Asn Ser Phe Arg Ser Gly Ile Asp Ser
          210              215              220

Lys Asn Val Met Val Ser Pro Ser Ile Thr Val Lys Leu Asp Asn Gly
          225              230              235              240

Leu Lys Trp Thr Gly Gln Tyr Thr Tyr Asp Asn Val Glu Arg Thr Pro
          245              250              255

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Asp Arg Ser Pro Thr Lys Ser Val Tyr Asp Arg Phe Gly Leu Pro Tyr
 260 265 270

Arg Met Gly Phe Ala His Pro Asn Asp Phe Val Lys Asp Lys Leu Gln
 275 280 285

Val Trp Arg Ser Asp Leu Glu Tyr Ala Phe Asn Asp Lys Trp Arg Ala
 290 295 300

Gln Trp Gln Leu Ala His Arg Thr Ala Ala Gln Asp Phe Asp His Phe
 305 310 315 320

Tyr Ala Gly Ser Glu Asn Gly Ser Arg Ile Lys Arg Asn Tyr Ala Trp
 325 330 335

Gln Gln Thr Asp Asn Lys Thr Leu Ser Ser Asn Phe Thr Leu Asn Gly
 340 345 350

Asp Tyr Thr Ile Gly Arg Phe Glu Asn His Leu Thr Val Gly Met Asp
 355 360 365

Tyr Ser Arg Glu His Arg Asn Pro Thr Leu Gly Tyr Arg Gly Ser Phe
 370 375 380

Thr Val Pro Ile Asn Pro Tyr Asp Arg Ala Ser Trp Pro Ala Ser Gly
 385 390 395 400

Arg Leu Gln Pro Ile Leu Thr Gln Asn Arg His Lys Ala Asp Ser Tyr
 405 410 415

Gly Ile Phe Val Gln Asn Ile Phe Ser Ala Thr Pro Asp Leu Lys Phe
 420 425 430

Val Leu Gly Gly Arg Tyr Asp Lys Tyr Thr Phe Asn Ser Glu Asn Lys
 435 440 445

Leu Thr Gly Asn Ser Arg Gln Tyr Ser Gly His Ser Phe Ser Pro Asn
 450 455 460

Ile Gly Ala Val Trp Asn Ile Asn Pro Val His Thr Leu Tyr Ala Ser
 465 470 475 480

Tyr Asn Lys Gly Phe Ala Pro Tyr Gly Gly Arg Gly Tyr Leu Ser Ile
 485 490 495

Asp Thr Ser Ser Ala Ala Val Phe Asn Ala Ala Pro Glu Tyr Thr Pro
 500 505 510

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Asn Thr Lys Pro Ala Ser Lys Ala Val Gly Trp Thr Ile Val Trp Thr
 515 520 525

Pro Pro Cys Arg Phe Thr Lys Ser Asn Ala Ser Ile Ser Ala Thr Ala
 530 535 540

Pro Ile Gln Lys Thr Thr Leu Ile Phe Met Arg Leu Ala Ala Asn Thr
 545 550 555 560

Val Arg Ala Ala Trp Asn Cys Pro Pro Ser Gly Lys Ser Ser Pro Lys
 565 570 575

Asn Ser Ile Cys Ala Val Arg Trp Ala Cys Arg Arg Lys Ser Leu Lys
 580 585 590

Thr Lys Lys Ile Pro Thr Glu Trp Ala Ser Ile Ile Thr Pro Ala Thr
 595 600 605

Leu Pro Ala Thr Cys Phe Ser Val Ile Pro Arg Pro Lys Thr Ser Thr
 610 615 620

Ala Lys Ser Ala Pro Val Arg Ala Asn Ala Thr Val Thr Thr Gln Glu
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Ile Lys Lys Leu Arg Phe Gln Ala Leu Pro Glu Leu Met Pro Cys Leu
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Ala Gly Thr Ile Lys Met Leu Thr Leu Pro Leu Pro Gln Pro Ile Cys
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Ser Ile Lys Asn Ile Gly Val Arg Thr Leu Cys Arg Val Ile Arg Ala
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Ala Ile Leu Pro Gly Ile Thr Val Ser
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<210> 47

<211> 2113

<212> DNA

<213> Neisseria meningitidis

<400> 47

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 gtggtcggac agtccgacac cagcgtactc aaaggctaca tcaactacga cgaagccgcc 180
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<210> 48

<211> 697

<212> PRT

<213> Neisseria meningitidis

<400> 48

Met Gln Ile Pro Phe His Leu Ala Leu Leu Pro Thr Leu Ile Ile Ala

1

5

10

15

Ser Phe Pro Val Ala Ala Ala Asp Thr Gln Asp Asn Gly Glu His Tyr

20

25

30

Thr Ala Thr Leu Pro Thr Val Ser Val Val Gly Gln Ser Asp Thr Ser

35

40

45

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Val Leu Lys Gly Tyr Ile Asn Tyr Asp Glu Ala Ala Val Thr Arg Asn
 50 55 60

Gly Gln Leu Ile Lys Glu Thr Pro Gln Thr Ile Asp Thr Leu Asn Ile
 65 70 75 80

Gln Lys Asn Lys Asn Tyr Gly Thr Asn Asp Leu Ser Ser Ile Leu Glu
 85 90 95

Gly Asn Ala Gly Ile Asp Ala Ala Tyr Asp Met Arg Gly Glu Ser Ile
 100 105 110

Phe Leu Arg Gly Phe Gln Ala Asp Ala Ser Asp Ile Tyr Arg Asp Gly
 115 120 125

Val Arg Glu Ser Gly Gln Val Arg Arg Ser Thr Ala Asn Ile Glu Arg
 130 135 140

Val Glu Ile Leu Lys Gly Pro Ser Ser Val Leu Tyr Gly Arg Thr Asn
 145 150 155 160

Gly Gly Gly Val Ile Asn Met Val Ser Lys Tyr Ala Asn Phe Lys Gln
 165 170 175

Ser Arg Asn Ile Gly Thr Val Tyr Gly Ser Trp Ala Asn Arg Ser Leu
 180 185 190

Asn Met Asp Ile Asn Glu Val Leu Asn Lys Asn Val Ala Ile Arg Leu
 195 200 205

Thr Gly Glu Val Gly Arg Ala Asn Ser Phe Arg Ser Gly Ile Asp Ser
 210 215 220

Lys Asn Val Met Val Ser Pro Ser Ile Thr Val Lys Leu Asp Asn Gly
 225 230 235 240

Leu Lys Trp Thr Gly Gln Tyr Thr Tyr Asp Asn Val Glu Arg Thr Pro
 245 250 255

Asp Arg Ser Pro Thr Lys Ser Val Tyr Asp Arg Phe Gly Leu Pro Tyr
 260 265 270

Arg Met Gly Phe Ala His Arg Asn Asp Phe Val Lys Asp Lys Leu Gln
 275 280 285

Val Trp Arg Ser Asp Leu Glu Tyr Ala Phe Asn Asp Lys Trp Arg Ala
 290 295 300

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Gln Trp Gln Leu Ala His Arg Thr Ala Ala Gln Asp Phe Asp His Phe
 305 310 315 320

Tyr Ala Gly Ser Glu Asn Gly Asn Leu Ile Lys Arg Asn Tyr Ala Trp
 325 330 335

Gln Gln Thr Asp Asn Lys Thr Leu Ser Ser Asn Leu Thr Leu Asn Gly
 340 345 350

Asp Tyr Thr Ile Gly Arg Phe Glu Asn His Leu Thr Val Gly Met Asp
 355 360 365

Tyr Ser Arg Glu His Arg Asn Pro Thr Leu Gly Phe Ser Ser Ala Phe
 370 375 380

Ser Ala Ser Ile Asn Pro Tyr Asp Arg Ala Ser Trp Pro Ala Ser Gly
 385 390 395 400

Arg Leu Gln Pro Ile Leu Thr Gln Asn Arg His Lys Ala Asp Ser Tyr
 405 410 415

Gly Ile Phe Val Gln Asn Ile Phe Ser Ala Thr Pro Asp Leu Lys Phe
 420 425 430

Val Leu Gly Gly Arg Tyr Asp Lys Tyr Thr Phe Asn Ser Glu Asn Lys
 435 440 445

Leu Thr Gly Ser Ser Arg Gln Tyr Ser Gly His Ser Phe Ser Pro Asn
 450 455 460

Ile Gly Ala Val Trp Asn Ile Asn Pro Val His Thr Leu Tyr Ala Ser
 465 470 475 480

Tyr Asn Lys Gly Phe Ala Pro Tyr Gly Gly Arg Gly Gly Tyr Leu Ser
 485 490 495

Ile Asp Thr Leu Ser Ser Ala Val Phe Asn Ala Asp Pro Glu Tyr Thr
 500 505 510

Arg Gln Tyr Glu Thr Gly Val Lys Ser Ser Trp Leu Asp Asp Arg Leu
 515 520 525

Ser Thr Thr Leu Ser Ala Tyr Gln Ile Glu Arg Phe Asn Ile Arg Tyr
 530 535 540

Arg Pro Asp Pro Lys Asn Asn Pro Tyr Ile Tyr Ala Val Ser Gly Lys
 545 550 555 560

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tacagtttct aa 2112

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<210> 50

<211> 703

<212> PRT

<213> *Neisseria meningitidis*

<400> 50

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Met Lys Ile Ser Phe His Leu Ala Leu Leu Pro Thr Leu Ile Ile Ala
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Ser Phe Pro Val Ala Ala Ala Asp Thr Gln Asp Asn Gly Glu His Tyr
          20                      25                      30

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```

Thr Ala Thr Leu Pro Thr Val Ser Val Val Gly Gln Ser Asp Thr Ser
          35                      40                      45

```

```

Val Leu Lys Gly Tyr Ile Asn Tyr Asp Glu Ala Ala Val Thr Arg Asn
          50                      55                      60

```

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Gly Gln Leu Ile Lys Glu Thr Pro Gln Thr Ile Asp Thr Leu Asn Ile
          65                      70                      75                      80

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```

Gln Lys Asn Lys Asn Tyr Gly Thr Asn Asp Leu Ser Ser Ile Leu Glu
          85                      90                      95

```

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Gly Asn Ala Gly Ile Asp Ala Ala Tyr Asp Met Arg Gly Glu Ser Ile

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Val Arg Glu Ser Gly Gln Val Arg Arg Ser Thr Ala Asn Ile Glu Arg		
130	135	140
Val Glu Ile Leu Lys Gly Pro Ser Ser Val Leu Tyr Gly Arg Thr Asn		
145	150	155 160
Gly Gly Gly Val Ile Asn Met Val Ser Lys Tyr Ala Asn Phe Lys Gln		
165	170	175
Ser Arg Asn Ile Gly Ala Val Tyr Gly Ser Trp Ala Asn Arg Ser Leu		
180	185	190
Asn Met Asp Ile Asn Glu Val Leu Asn Lys Asn Val Ala Ile Arg Leu		
195	200	205
Thr Gly Glu Val Gly Arg Ala Asn Ser Phe Arg Ser Gly Ile Asp Ser		
210	215	220
Lys Asn Val Met Val Ser Pro Ser Ile Thr Val Lys Leu Asp Asn Gly		
225	230	235 240
Leu Lys Trp Thr Gly Gln Tyr Thr Tyr Asp Asn Val Glu Arg Thr Pro		
245	250	255
Asp Arg Ser Pro Thr Lys Ser Val Tyr Asp Arg Phe Gly Leu Pro Tyr		
260	265	270
Arg Met Gly Phe Ala His Arg Asn Asp Phe Val Lys Asp Lys Leu Gln		
275	280	285
Val Trp Arg Ser Asp Leu Glu Tyr Ala Phe Asn Asp Lys Trp Arg Ala		
290	295	300
Gln Trp Gln Leu Ala His Arg Thr Ala Ala Gln Asp Phe Asp His Phe		
305	310	315 320
Tyr Ala Gly Ser Glu Asn Gly Asn Leu Ile Lys Arg Asn Tyr Ala Trp		
325	330	335
Gln Gln Thr Asp Asn Lys Thr Leu Ser Ser Asn Phe Thr Leu Asn Gly		
340	345	350
Asp Tyr Thr Ile Gly Arg Phe Glu Asn His Leu Thr Val Gly Met Asp		

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355		360		365
Tyr Ser Arg Glu His Arg Asn Pro Thr Leu Gly Tyr Ser Arg Ala Phe				
370		375		380
Thr Ala Ser Ile Asp Pro Tyr Asp Arg Ala Ser Trp Pro Ala Ser Gly				
385		390		395 400
Arg Leu Gln Pro Ile Leu Thr Gln Asn Arg His Lys Ala Asp Ser Tyr				
	405		410	415
Gly Ile Phe Val Gln Asn Ile Phe Ser Ala Thr Pro Asp Leu Lys Phe				
	420		425	430
Val Leu Gly Gly Arg Tyr Asp Lys Tyr Thr Phe Asn Ser Glu Asn Lys				
	435		440	445
Leu Thr Gly Ser Ser Arg Gln Tyr Ser Gly His Ser Phe Ser Pro Asn				
	450		455	460
Ile Gly Ala Val Trp Asn Ile Asn Pro Val His Thr Leu Tyr Ala Ser				
465		470		475 480
Tyr Asn Lys Gly Phe Ala Pro Tyr Gly Gly Arg Gly Gly Tyr Leu Ser				
	485		490	495
Ile Asn Thr Ser Ser Ser Ala Val Phe Asn Ala Asp Pro Glu Tyr Thr				
	500		505	510
Arg Gln Tyr Glu Thr Gly Val Lys Ser Ser Trp Leu Asp Asp Arg Leu				
	515		520	525
Ser Thr Thr Leu Ser Ala Tyr Gln Ile Glu Arg Phe Asn Ile Arg Tyr				
	530		535	540
Arg Pro Asp Glu Gln Asn Asp Pro Tyr Thr Trp Ala Val Gly Gly Lys				
545		550		555 560
His Arg Ser Arg Gly Val Glu Leu Ser Ala Ile Gly Gln Ile Ile Pro				
	565		570	575
Lys Lys Leu Tyr Leu Arg Gly Ser Leu Gly Val Met Gln Ala Lys Val				
	580		585	590
Val Glu Asp Lys Glu Asn Pro Asp Arg Val Gly Ile His Leu Asn Asn				
	595		600	605
Thr Ser Asn Val Thr Gly Asn Leu Phe Phe Arg Tyr Thr Pro Thr Glu				

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610	615	620
Asn Leu Tyr Gly Glu Ile Gly Val Thr Gly Thr Gly Lys Arg Tyr Gly		
625	630	635 640
Tyr Asn Ser Arg Asn Lys Glu Val Thr Thr Leu Pro Gly Phe Ala Arg		
645	650	655
Val Asp Ala Met Leu Gly Trp Asn His Lys Asn Val Asn Ile Thr Phe		
660	665	670
Ala Ala Ala Asn Leu Leu Asn Gln Lys Tyr Trp Arg Ser Asp Ala Met		
675	680	685
Pro Gly Ala Pro Arg Thr Tyr Thr Ala Arg Val Asn Tyr Ser Phe		
690	695	700

<210> 51

<211> 2112

<212> DNA

<213> Neisseria meningitidis

<400> 51

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gttaccgcga acggacagct catcaaagaa acgccgcaaa ccatcgatac gctcaatatc 240
cagaaaaaca aaaattacgg tacgaacgat ttgagttcca tctcgaagg caatgccggc 300
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 cttggctgga accataaaaa tggttaacgtt acctttgccg cagccaatct gctcaatcaa 2040
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 taccgtttct ga 2112

<210> 52

<211> 703

<212> PRT

<213> Neisseria meningitidis

<400> 52

Met Lys Ile Ser Phe His Leu Ala Leu Leu Pro Thr Leu Ile Ile Ala
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Ser Phe Pro Val Ala Ala Ala Asp Thr Gln Asp Asn Gly Glu His Tyr
 20 25 30

Thr Ala Thr Leu Pro Thr Val Ser Val Val Gly Gln Ser Asp Thr Ser
 35 40 45

Val Leu Lys Gly Tyr Ile Asn Tyr Asp Glu Ala Ala Val Thr Arg Asn
 50 55 60

Gly Gln Leu Ile Lys Glu Thr Pro Gln Thr Ile Asp Thr Leu Asn Ile
 65 70 75 80

Gln Lys Asn Lys Asn Tyr Gly Thr Asn Asp Leu Ser Ser Ile Leu Glu
 85 90 95

Gly Asn Ala Gly Ile Asp Ala Ala Tyr Asp Met Arg Gly Glu Ser Ile
 100 105 110

Phe Leu Arg Gly Phe Gln Ala Asp Ala Ser Asp Ile Tyr Arg Asp Gly
 115 120 125

Val Arg Glu Ser Gly Gln Val Arg Arg Ser Thr Ala Asn Ile Glu Arg
 130 135 140

Val Glu Ile Leu Lys Gly Pro Ser Ser Val Leu Tyr Gly Arg Thr Asn
 145 150 155 160

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Gly Gly Gly Val Ile Asn Met Val Ser Lys Tyr Ala Asn Phe Lys Gln
 165 170 175

Ser Arg Asn Ile Gly Ala Val Tyr Gly Ser Trp Ala Asn Arg Ser Leu
 180 185 190

Asn Met Asp Ile Asn Glu Val Leu Asn Lys Asn Val Ala Ile Arg Leu
 195 200 205

Thr Gly Glu Val Gly Arg Ala Asn Ser Phe Arg Ser Gly Ile Asp Ser
 210 215 220

Lys Asn Val Met Val Ser Pro Ser Ile Thr Val Lys Leu Asp Asn Gly
 225 230 235 240

Leu Lys Trp Thr Gly Gln Tyr Thr Tyr Asp Asn Val Glu Arg Thr Pro
 245 250 255

Asp Arg Ser Pro Thr Lys Ser Val Tyr Asp Arg Phe Gly Leu Pro Tyr
 260 265 270

Arg Met Gly Phe Ala His Arg Asn Asp Phe Val Lys Asp Lys Leu Gln
 275 280 285

Val Trp Arg Ser Asp Leu Glu Tyr Ala Phe Asn Asp Lys Trp Arg Ala
 290 295 300

Gln Trp Gln Leu Ala His Arg Thr Ala Ala Gln Asp Phe Asp His Phe
 305 310 315 320

Tyr Ala Gly Ser Glu Asn Gly Asn Leu Ile Lys Arg Asn Tyr Ala Trp
 325 330 335

Gln Gln Thr Asp Asn Lys Thr Leu Ser Ser Asn Leu Thr Leu Asn Gly
 340 345 350

Asp Tyr Thr Ile Gly Arg Phe Glu Asn His Leu Thr Val Gly Met Asp
 355 360 365

Tyr Ser Arg Glu His Arg Asn Pro Thr Leu Gly Phe Ser Ser Ala Phe
 370 375 380

Ser Ala Ser Ile Asn Pro Tyr Asp Arg Ala Ser Trp Pro Ala Ser Gly
 385 390 395 400

Arg Leu Gln Pro Ile Leu Thr Gln Asn Arg His Lys Ala Asp Ser Tyr
 405 410 415

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Gly Ile Phe Val Gln Asn Ile Phe Ser Ala Thr Pro Asp Leu Lys Phe
 420 425 430

Val Leu Gly Gly Arg Tyr Asp Lys Tyr Thr Phe Asn Ser Glu Asn Lys
 435 440 445

Leu Thr Gly Ser Ser Arg Gln Tyr Ser Gly His Ser Phe Ser Pro Asn
 450 455 460

Ile Gly Ala Val Trp Asn Ile Asn Pro Val His Thr Leu Tyr Ala Ser
 465 470 475 480

Tyr Asn Lys Gly Phe Ala Pro Tyr Gly Gly Arg Gly Gly Tyr Leu Ser
 485 490 495

Ile Asp Thr Leu Ser Ser Ala Val Phe Asn Ala Asp Pro Glu Tyr Thr
 500 505 510

Arg Gln Tyr Glu Thr Gly Val Lys Ser Ser Trp Leu Asp Asp Arg Leu
 515 520 525

Ser Thr Thr Leu Ser Ala Tyr Gln Ile Glu Arg Phe Asn Ile Arg Tyr
 530 535 540

Arg Pro Asp Pro Lys Asn Asn Pro Tyr Ile Tyr Ala Val Ser Gly Lys
 545 550 555 560

His Arg Ser Arg Gly Val Glu Leu Ser Ala Ile Gly Gln Ile Ile Pro
 565 570 575

Lys Lys Leu Tyr Leu Arg Gly Ser Leu Gly Val Met Gln Ala Lys Val
 580 585 590

Val Glu Asp Lys Glu Asn Pro Asp Arg Val Gly Ile His Leu Asn Asn
 595 600 605

Thr Ser Asn Val Thr Gly Asn Leu Phe Phe Arg Tyr Thr Pro Thr Glu
 610 615 620

Asn Leu Tyr Gly Glu Ile Gly Val Thr Gly Thr Gly Lys Arg Tyr Gly
 625 630 635 640

Tyr Asn Ser Arg Asn Lys Glu Val Thr Thr Leu Pro Gly Phe Ala Arg
 645 650 655

Val Asp Ala Met Leu Gly Trp Asn His Lys Asn Val Asn Val Thr Phe
 660 665 670

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Ala Ala Ala Asn Leu Leu Asn Gln Lys Tyr Trp Arg Ser Asp Ser Met
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Pro Gly Asn Pro Arg Gly Tyr Thr Ala Arg Val Asn Tyr Arg Phe
 690 695 700

<210> 53

<211> 693

<212> DNA

<213> *Neisseria meningitidis*

<400> 53

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<210> 54

<211> 230

<212> PRT

<213> *Neisseria meningitidis*

<400> 54

Met Lys Arg Phe Thr Tyr Thr Leu Ser Asp Gly Leu Cys Ile Glu Ile
 1 5 10 15

Glu Leu Lys Arg Ser Ala Lys Lys Asn Leu Ile Leu Arg Pro Val Asn
 20 25 30

Met Gln Thr Val Ser Ile Asn Val Pro Pro Phe Phe Gln Asp His Ala
 35 40 45

Leu Ala Asn Trp Leu Ala Ala Asn Glu Thr Ile Leu Arg Asn Thr Leu
 50 55 60

Ala Lys Met Pro Val His Pro Val Ser His Pro Asn Leu Pro Glu Trp
 65 70 75 80

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Ile Trp Tyr Arg Gly Ile Lys Thr Lys Leu Asp Thr His Ser Gln Ser
85 90 95

His Ile Arg Ile Thr Ser Ser Glu Ile Leu Leu Pro Arg Lys Glu Thr
100 105 110

Ala Ala Gln Ile Asp His Leu Arg Arg Leu Leu Asn Glu Arg Ala Arg
115 120 125

Glu Tyr Leu Leu Pro Arg Leu Glu Lys His Ala Ala Glu Thr Gly Leu
130 135 140

Thr Pro Ala Ala Thr Asp Leu Ser Asn Ala Lys Thr Phe Trp Gly Val
145 150 155 160

Cys Arg Pro His Thr Gly Ile Arg Leu Asn Trp Arg Leu Ile Gly Thr
165 170 175

Pro Glu Tyr Val Ala Asp Tyr Val Cys Ile His Glu Leu Cys His Leu
180 185 190

Arg His Pro Asp His Ser Pro Arg Phe Trp His Leu Val Asn Thr Leu
195 200 205

Thr Pro His Thr Asp Asn Ala Lys Ser Trp Leu Lys Ala His Gly Arg
210 215 220

Glu Leu Phe Val Leu Gly
225 230

<210> 55

<211> 546

<212> DNA

<213> Neisseria meningitidis

<400> 55

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<210> 56

<211> 181

<212> PRT

<213> Neisseria meningitidis

<400> 56

Met Ser Lys Ile Ile Val Leu Thr Ala Gly His Ser Asn Thr Asp Pro
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Gly Ala Val Asn Gly Ser Asp Arg Glu Ala Asp Leu Ala Gln Asp Met
 20 25 30

Arg Asn Ile Val Ala Ser Ile Leu Arg Asn Asp Tyr Gly Leu Thr Val
 35 40 45

Lys Thr Asp Gly Thr Gly Lys Gly Asn Met Pro Leu Arg Glu Ala Val
 50 55 60

Lys Leu Ile Arg Gly Ser Asp Val Ala Ile Glu Phe His Thr Asn Ala
 65 70 75 80

Ala Val Ser Lys Ala Ala Thr Gly Ile Glu Ala Leu Ser Thr Val Lys
 85 90 95

Asn Lys Arg Trp Cys Gln Val Leu Ser Lys Ala Val Ala Lys Lys Thr
 100 105 110

Gly Trp Lys Leu Arg Gly Glu Asp Gly Phe Lys Pro Asp Asn Ala Gly
 115 120 125

Gln His Ser Arg Leu Ala Tyr Ala Gln Ala Gly Gly Ile Val Phe Glu
 130 135 140

Pro Phe Phe Ile Ser Asn Asp Thr Asp Leu Ala Leu Phe Lys Thr Thr
 145 150 155 160

Lys Trp Gly Ile Cys Arg Ala Ile Ala Asp Ala Ile Ala Met Glu Leu
 165 170 175

Gly Ala Ala Arg Val
 180

<210> 57

<211> 237

<212> DNA

<213> Neisseria meningitidis

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<400> 57

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 gcggagattt ggcgggtgta tttgggcatt gtcggcggtc atgcggtggc gcgttcgttg 180
 gtcagcgtca aacgtcagga ggctcgagaat gaatctcgtg aaactgctgg cgaataa 237

<210> 58

<211> 78

<212> PRT

<213> Neisseria meningitidis

<400> 58

Met Arg Ile Leu Asp Ile Phe Lys Asn Pro Ala Thr Gly Asn Val Ser
 1 5 10 15

His Ser Lys Leu Trp Ala Asn Val Ala Cys Ala Ala Gly Thr Val Lys
 20 25 30

Phe Val Met Leu Pro Asp Pro Ser Ala Glu Ile Trp Ala Val Tyr Leu
 35 40 45

Gly Ile Val Gly Gly Tyr Ala Val Ala Arg Ser Leu Val Ser Val Lys
 50 55 60

Arg Gln Glu Val Glu Asn Glu Ser Arg Glu Thr Ala Gly Glu
 65 70 75

<210> 59

<211> 468

<212> DNA

<213> Neisseria meningitidis

<400> 59

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 gctttggcga aaaaacaggc ggaagtcagc cgtctgaaaa cggaataa aaaggaaatc 360
 gaaaatgtcc ttactcaaga ccgtaaaaat gcaggcggcg gttgtattga cggctttggc 420
 catcacggct tgcagctcta caagcgcgcc ctcggtacg gaaattaa 468

<210> 60

<211> 155

<212> PRT

<213> Neisseria meningitidis

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<400> 60

Met Arg Trp Arg Val Arg Trp Ser Ala Ser Asn Val Arg Arg Ser Arg
 1 5 10 15

Met Asn Leu Val Lys Leu Leu Ala Asn Asn Trp Gln Pro Ile Ala Ile
 20 25 30

Ile Ala Leu Val Gly Thr Gly Leu Ala Val Ser His His Gln Gly Tyr
 35 40 45

Lys Ser Ala Phe Ala Lys Gln Gln Ala Val Ile Glu Lys Met Lys Arg
 50 55 60

Asp Lys Ala Gln Ala Leu Leu Leu Ser Ala Gln Asn Tyr Ala Arg Glu
 65 70 75 80

Leu Glu Gln Ala Arg Ala Glu Ala Lys Lys Tyr Glu Val Lys Ala His
 85 90 95

Ala Val Gly Met Ala Leu Ala Lys Lys Gln Ala Glu Val Ser Arg Leu
 100 105 110

Lys Thr Glu Asn Lys Lys Glu Ile Glu Asn Val Leu Thr Gln Asp Arg
 115 120 125

Lys Asn Ala Gly Gly Gly Cys Ile Asp Gly Phe Gly His His Gly Leu
 130 135 140

Gln Leu Tyr Lys Arg Ala Leu Gly Tyr Gly Asn
 145 150 155

<210> 61

<211> 306

<212> DNA

<213> *Neisseria meningitidis*

<400> 61

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 gacggcaaga cggccacgct gttggaacac gccgccgagt ttggcggcta tgttgccgaa 240
 cttgaaaacc aaaatcaggc ttggcgcgac tgggcgggca atcactcccg caaagtcgga 300
 aactga 306

<210> 62

<211> 101

WO 01/04150

PCT/EP00/06943

<212> PRT

<213> Neisseria meningitidis

<400> 62

Met Ser Leu Leu Lys Thr Val Lys Met Gln Ala Ala Val Val Leu Thr
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Ala Leu Ala Ile Thr Ala Cys Ser Ser Thr Ser Ala Pro Ser Ala Thr
 20 25 30

Glu Ile Lys Val Val Glu Lys Ala Val Met Pro Thr Pro Pro Ala Ala
 35 40 45

Leu Met Val Ala Pro Val Arg Pro Asn Pro Pro Lys Asp Gly Lys Thr
 50 55 60

Ala Thr Leu Leu Glu His Ala Ala Glu Phe Gly Gly Tyr Val Ala Glu
 65 70 75 80

Leu Glu Asn Gln Asn Gln Ala Trp Arg Asp Trp Ala Gly Asn His Ser
 85 90 95

Arg Lys Val Gly Asn
 100

<210> 63

<211> 348

<212> DNA

<213> Neisseria meningitidis

<400> 63

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 gtttctccta tgaatgagta cacgttttct taccgcttta acggcaagtc ctgggtcattg 180
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 aagaaattgt acaagcggac aaaatattta atgggtatca aagaatga 348

<210> 64

<211> 115

<212> PRT

<213> Neisseria meningitidis

<400> 64

Val Leu Ala Val Leu Leu Ala Gly Val Ala Phe Ala Leu Ser Asp Asp
 1 5 10 15

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Phe Met Val Gly Cys Phe Gln Thr Pro Thr Val Phe Ala Phe Cys Val
 20 25 30

Phe Ile Asp Phe Lys Ile His Lys Val Ser Pro Met Asn Glu Tyr Thr
 35 40 45

Phe Ser Tyr Arg Phe Asn Gly Lys Ser Trp Ser Leu Ser Ile Trp Ala
 50 55 60

Asp Asn Pro Glu Glu Ala Arg Ala Lys Phe Arg Ala Ala Arg Glu Asn
 65 70 75 80

Ala His Tyr Asp Gly Glu Val Val Ala Lys Val Tyr Thr Phe Val Asn
 85 90 95

Ile Ser Trp Val Lys Lys Leu Tyr Lys Arg Thr Lys Tyr Leu Met Gly
 100 105 110

Ile Lys Glu
 115

<210> 65

<211> 1404

<212> DNA

<213> *Neisseria meningitidis*

<400> 65

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 caaagcaggt tgcatacgca ggctgcagaa cagcgtttcg atgcggcacg cgaagaattg 480
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 catgcggcgg aaaaagaggc ttatgcccag caggtaaggc aggcgcaggc tttattcaat 600
 aaaggtgctg ccaccgcgct ggatattcac gaagccaaag ccggttacga caatgcctg 660
 gcccaagaaa tcgccgtatt ggctgagaaa caaacctatg aaaaccagtt gaacgactac 720
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ttggaaagca gccgtttgaa actgaaatcg accgaaaaccg gccacaata cggcatccgc 1260
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 caagcacggt ataaattcat gctggcttat ttgcgcttgg tgaaagagag cgggttaggg 1380
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<210> 66

<211> 467

<212> PRT

<213> Neisseria meningitidis

<400> 66

Met Thr Leu Leu Asn Leu Met Ile Met Gln Asp Tyr Gly Ile Ser Val
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Cys Leu Thr Leu Thr Pro Tyr Leu Gln His Glu Leu Phe Ser Ala Met
 20 25 30

Lys Ser Tyr Phe Ser Lys Tyr Ile Leu Pro Val Ser Leu Phe Thr Leu
 35 40 45

Pro Leu Ser Leu Ser Pro Ser Val Ser Ala Phe Thr Leu Pro Glu Ala
 50 55 60

Trp Arg Ala Ala Gln Gln His Ser Ala Asp Phe Gln Ala Ser His Tyr
 65 70 75 80

Gln Arg Asp Ala Val Arg Ala Arg Gln Gln Gln Ala Lys Ala Ala Phe
 85 90 95

Leu Pro His Val Ser Ala Asn Ala Ser Tyr Gln Arg Gln Pro Pro Ser
 100 105 110

Ile Ser Ser Thr Arg Glu Thr Gln Gly Trp Ser Val Gln Val Gly Gln
 115 120 125

Thr Leu Phe Asp Ala Ala Lys Phe Ala Gln Tyr Arg Gln Ser Arg Phe
 130 135 140

Asp Thr Gln Ala Ala Glu Gln Arg Phe Asp Ala Ala Arg Glu Glu Leu
 145 150 155 160

Leu Leu Lys Val Ala Glu Ser Tyr Phe Asn Val Leu Leu Ser Arg Asp
 165 170 175

Thr Val Ala Ala His Ala Ala Glu Lys Glu Ala Tyr Ala Gln Gln Val
 180 185 190

Arg Gln Ala Gln Ala Leu Phe Asn Lys Gly Ala Ala Thr Ala Leu Asp

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195		200		205
Ile His Glu Ala Lys Ala Gly Tyr Asp Asn Ala Leu Ala Gln Glu Ile				
210		215		220
Ala Val Leu Ala Glu Lys Gln Thr Tyr Glu Asn Gln Leu Asn Asp Tyr				
225		230		235 240
Thr Gly Leu Asp Ser Lys Gln Ile Glu Ala Ile Asp Thr Ala Asn Leu				
	245		250	255
Leu Ala Arg Tyr Leu Pro Lys Leu Glu Arg Tyr Ser Leu Asp Glu Trp				
	260		265	270
Gln Arg Ile Ala Leu Ser Asn Asn His Glu Tyr Arg Met Gln Gln Leu				
	275		280	285
Ala Leu Gln Ser Ser Gly Gln Ala Leu Arg Ala Ala Gln Asn Ser Arg				
	290		295	300
Tyr Pro Thr Val Ser Ala His Val Gly Tyr Gln Asn Asn Leu Tyr Thr				
305		310		315 320
Ser Ser Ala Gln Asn Asn Asp Tyr His Tyr Arg Gly Lys Gly Met Ser				
	325		330	335
Val Gly Val Gln Leu Asn Leu Pro Leu Tyr Thr Gly Gly Glu Leu Ser				
	340		345	350
Gly Lys Ile His Glu Ala Glu Ala Gln Tyr Gly Ala Ala Glu Ala Gln				
	355		360	365
Leu Thr Ala Thr Glu Arg His Ile Lys Leu Ala Val Arg Gln Ala Tyr				
	370		375	380
Thr Glu Ser Gly Ala Ala Arg Tyr Gln Ile Met Ala Gln Glu Arg Val				
385		390		395 400
Leu Glu Ser Ser Arg Leu Lys Leu Lys Ser Thr Glu Thr Gly Gln Gln				
	405		410	415
Tyr Gly Ile Arg Asn Arg Leu Glu Val Ile Arg Ala Arg Gln Glu Val				
	420		425	430
Ala Gln Ala Glu Gln Lys Leu Ala Gln Ala Arg Tyr Lys Phe Met Leu				
	435		440	445
Ala Tyr Leu Arg Leu Val Lys Glu Ser Gly Leu Gly Leu Glu Thr Val				

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450

455

460

Phe Ala Glu

465

<210> 67

<211> 1404

<212> DNA

<213> *Neisseria meningitidis*

<400> 67

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ctaccggttt cacttttttac cttgccacta tccctttccc catccgtttc ggctttttacg 180
ctgcctgaag catggcgggc ggcgagcaa cattcggctg attttcaagc gtcccattac 240
cagcgtgatg cagtgcgcgc acggcaacaa caagccaagg ccgcattcct tccccatgta 300
tccgccaatg ccagctacca gcgccagccg ccatcgattt cttccacccg cgaaacacag 360
ggatggagcg tgcaggtggg acaaacctta tttgacgctg ccaaatttgc acaataaccgc 420
caaagcaggt tcgatacgca ggctgcagaa cagcgtttcg atgcggcacg cgaagaattg 480
ctgttgaaag ttgccgaaag ttatttcaac gttttactca gccgagacac cgttgccgcc 540
catgcggcgg aaaaagaggg ttatgccagc caggtaaggc aggcgcaggc tttattcaat 600
aaaggtgctg ccaccgcgct ggatattcac gaagccaaag ccggttacga caatgccctg 660
gccaagaaa tcgccgtatt ggctgagaaa caaacctatg aaaaccagtt gaacgactac 720
accggcctgg acagcaaaca aatcgaggcc atagataccg ccaacctgtt ggcaacgctat 780
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caagcacggt ataaattcat gctggcttat ttgcgcttgg tgaaagagag cgggttaggg 1380
ttggaaacgg tatttgcgga ataa 1404

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<210> 68

<211> 467

<212> PRT

<213> *Neisseria meningitidis*

<400> 68

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Met Thr Leu Leu Asn Leu Met Ile Met Gln Asp Tyr Gly Ile Ser Val
  1             5             10             15

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Cys Leu Thr Leu Thr Pro Tyr Leu Gln His Glu Leu Phe Ser Ala Met
      20             25             30

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Lys Ser Tyr Phe Ser Lys Tyr Ile Leu Pro Val Ser Leu Phe Thr Leu
 35 40 45
 Pro Leu Ser Leu Ser Pro Ser Val Ser Ala Phe Thr Leu Pro Glu Ala
 50 55 60
 Trp Arg Ala Ala Gln Gln His Ser Ala Asp Phe Gln Ala Ser His Tyr
 65 70 75 80
 Gln Arg Asp Ala Val Arg Ala Arg Gln Gln Gln Ala Lys Ala Ala Phe
 85 90 95
 Leu Pro His Val Ser Ala Asn Ala Ser Tyr Gln Arg Gln Pro Pro Ser
 100 105 110
 Ile Ser Ser Thr Arg Glu Thr Gln Gly Trp Ser Val Gln Val Gly Gln
 115 120 125
 Thr Leu Phe Asp Ala Ala Lys Phe Ala Gln Tyr Arg Gln Ser Arg Phe
 130 135 140
 Asp Thr Gln Ala Ala Glu Gln Arg Phe Asp Ala Ala Arg Glu Glu Leu
 145 150 155 160
 Leu Leu Lys Val Ala Glu Ser Tyr Phe Asn Val Leu Leu Ser Arg Asp
 165 170 175
 Thr Val Ala Ala His Ala Ala Glu Lys Glu Ala Tyr Ala Gln Gln Val
 180 185 190
 Arg Gln Ala Gln Ala Leu Phe Asn Lys Gly Ala Ala Thr Ala Leu Asp
 195 200 205
 Ile His Glu Ala Lys Ala Gly Tyr Asp Asn Ala Leu Ala Gln Glu Ile
 210 215 220
 Ala Val Leu Ala Glu Lys Gln Thr Tyr Glu Asn Gln Leu Asn Asp Tyr
 225 230 235 240
 Thr Gly Leu Asp Ser Lys Gln Ile Glu Ala Ile Asp Thr Ala Asn Leu
 245 250 255
 Leu Ala Arg Tyr Leu Pro Lys Leu Glu Arg Tyr Ser Leu Asp Glu Trp
 260 265 270
 Gln Arg Ile Ala Leu Ser Asn Asn His Glu Tyr Arg Met Gln Gln Leu
 275 280 285

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Ala Leu Gln Ser Ser Gly Gln Ala Leu Arg Ala Ala Gln Asn Ser Arg
 290 295 300

Tyr Pro Thr Val Ser Ala His Val Gly Tyr Gln Asn Asn Leu Tyr Thr
 305 310 315 320

Ser Ser Ala Gln Asn Asn Asp Tyr His Tyr Arg Gly Lys Gly Met Ser
 325 330 335

Val Gly Val Gln Leu Asn Leu Pro Leu Tyr Thr Gly Gly Glu Leu Ser
 340 345 350

Gly Lys Ile His Glu Ala Glu Ala Gln Tyr Gly Ala Ala Glu Ala Gln
 355 360 365

Leu Thr Ala Thr Glu Arg His Ile Lys Leu Ala Val Arg Gln Ala Tyr
 370 375 380

Thr Glu Ser Gly Ala Ala Arg Tyr Gln Ile Met Ala Gln Glu Arg Val
 385 390 395 400

Leu Glu Ser Ser Arg Leu Lys Leu Lys Ser Thr Glu Thr Gly Gln Gln
 405 410 415

Tyr Gly Ile Arg Asn Arg Leu Glu Val Ile Arg Ala Arg Gln Glu Val
 420 425 430

Ala Gln Ala Glu Gln Lys Leu Ala Gln Ala Arg Tyr Lys Phe Met Leu
 435 440 445

Ala Tyr Leu Arg Leu Val Lys Glu Ser Gly Leu Gly Leu Glu Thr Val
 450 455 460

Phe Ala Glu
 465

<210> 69

<211> 1400

<212> DNA

<213> Neisseria meningitidis

<400> 69

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 ccgtttcact ttttaccttg ccactatccc tttccccatc cgtttcggct tttacgctgc 180
 ctgaagcatg gcgggcggcg cagcaacatt cggctgattt tcaagcgtcc cattaccagc 240

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ccaatgccag ctaccagcgc cagccgccat cgattttcttc caccgcgcaa acacagggat 360
ggagcgtgca ggtgggacaa accttatttg actctgcaa atttgcacaa taccgccaaa 420
gcaggttcga tacgcaggct gcagaacagc gtttcgatgc ggcacgcgaa gaattgctgt 480
tgaaagtgtc cgaaagtatt ttcaacgttt tactcagccg agacaccgtt gccgcccatg 540
cggcggaaaa agaggcttat gcccagcagg taaggcaggc gcaggcttta ttcaataaag 600
gtgctgccac cgcgctagat attcacgaag ccaaagccgg ttacgacaat gccctggccc 660
aagaaatcgc cgtattggct gagaaacaaa cctatgaaaa ccagttgaac gactacaccg 720
gcctggacag caaacaatc gaggccatag ataccgcaa cctgttgga cgctatctgc 780
ccaagctgga acgttacagt ctggatgaat ggcagcgc at tgccttatcc aacaatcatg 840
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ctgcgcagaa taatgactac cactatcggg gcaaaggat gagcgtcggc gtacagttga 1020
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aaagcagccg tttgaaactg aaatcgaccg aaaccggcca acaatacggc atccgcaacc 1260
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cacggtataa attcatgctg gcttatttgc gcttggtgaa agagagcggg ttagggttgg 1380
aaacggtatt tgcggaataa 1400

```

<210> 70

<211> 450

<212> PRT

<213> Neisseria meningitidis

<400> 70

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Met Thr Leu Leu Asn Leu Ile Cys Lys Ile Thr Val Phe Pro Phe Ala
  1              5              10              15

His Arg Pro Ile Cys Asn Met Asn Tyr Phe Arg Leu Asn Pro Ile Phe
          20              25              30

Pro Asn Ile Ser Tyr Pro Phe His Phe Leu Pro Cys His Tyr Pro Phe
          35              40              45

Pro His Pro Phe Arg Leu Leu Arg Cys Leu Lys His Gly Gly Arg Arg
          50              55              60

Ser Asn Ile Arg Leu Ile Phe Lys Arg Pro Ile Thr Ser Val Met Gln
          65              70              75              80

Cys Ala His Gly Asn Asn Lys Pro Arg Pro His Ser Phe Pro Met Tyr
          85              90              95

Pro Pro Met Pro Ala Thr Ser Ala Ser Arg His Arg Phe Leu Pro Pro
          100              105              110

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Ala Lys His Arg Asp Gly Ala Cys Arg Trp Asp Lys Pro Tyr Leu Thr
115 120 125

Leu Pro Asn Leu His Asn Thr Ala Lys Ala Gly Ser Ile Arg Arg Leu
130 135 140

Gln Asn Ser Val Ser Met Arg His Ala Lys Asn Cys Cys Lys Leu Pro
145 150 155 160

Lys Val Ile Ser Thr Phe Tyr Ser Ala Glu Thr Pro Leu Pro Pro Met
165 170 175

Arg Arg Lys Lys Arg Leu Met Pro Ser Arg Gly Arg Arg Arg Leu Tyr
180 185 190

Ser Ile Lys Val Leu Pro Pro Arg Ile Phe Thr Lys Pro Lys Pro Val
195 200 205

Thr Thr Met Pro Trp Pro Lys Lys Ser Pro Tyr Trp Leu Arg Asn Lys
210 215 220

Pro Met Lys Thr Ser Thr Thr Thr Pro Ala Trp Thr Ala Asn Lys Ser
225 230 235 240

Arg Pro Ile Pro Pro Thr Cys Trp His Ala Ile Cys Pro Ser Trp Asn
245 250 255

Val Thr Val Trp Met Asn Gly Ser Ala Leu Pro Tyr Pro Thr Ile Met
260 265 270

Asn Thr Gly Cys Ser Ser Leu Pro Cys Lys Ala Ala Asp Arg Arg Phe
275 280 285

Gly Gln His Arg Thr Ala Ala Ile Pro Pro Phe Leu Pro Met Ser Ala
290 295 300

Ile Arg Ile Thr Ser Thr Leu His Leu Arg Arg Ile Met Thr Thr Thr
305 310 315 320

Ile Gly Ala Lys Gly Ala Ser Ala Tyr Ser Ile Cys Arg Phe Ile Pro
325 330 335

Ala Glu Asn Cys Arg Ala Lys Ser Met Lys Pro Lys Arg Asn Thr Gly
340 345 350

Leu Pro Lys His Ser Pro Gln Pro Ser Gly Thr Ser Asn Ser Pro Tyr
355 360 365

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Ala Arg Leu Ile Pro Lys Ala Val Arg Arg Val Thr Lys Ser Trp Arg
 370 375 380

Lys Asn Gly Phe Trp Lys Ala Ala Val Asn Asn Arg Pro Lys Pro Ala
 385 390 395 400

Asn Asn Thr Ala Ser Ala Thr Gly Trp Lys Tyr Gly Arg Gly Arg Lys
 405 410 415

Ser Pro Lys Gln Asn Arg Asn Trp Leu Lys His Gly Ile Asn Ser Cys
 420 425 430

Trp Leu Ile Cys Ala Trp Lys Arg Ala Gly Gly Trp Lys Arg Tyr Leu
 435 440 445

Arg Asn
 450

<210> 71

<211> 1404

<212> DNA

<213> Neisseria meningitidis

<400> 71

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 ctacccgttt cactttttac cttgccacta tccctttccc catccgtttc ggctttttacg 180
 ctgcctgaag catggcgggc ggcgagcaa cattcggctg attttcaagc gtcccattac 240
 cagcgtgatg cagtgcgcgc acggcaacaa caagccaagg ccgcattcct tccccatgta 300
 tccgccaatg ccagctacca gcgccagccg ccatcgattt cttccaccgc cgaaacacag 360
 ggatggagcg tgcaggtggg acaaacctta tttgacgctg ccaaatttgc acaataccgc 420
 caaagcaggt tcgatacgca ggctgcagaa cagcgtttcg atgcggcacg cgaagaattg 480
 ctgttgaaag ttgccgaaag ttattttcaac gttttactca gccgagacac cgttgccgcc 540
 catgcggcgcg aaaaagaggc ttatgccagc caggtaaggc aggcgcaggc tttattcaat 600
 aaaggtgctg ccaccgcgct ggatattcac gaagccaaag ccggttacga caatgccctg 660
 gcccaagaaa tcgccgtatt ggctgagaaa caaacctatg aaaaccagtt gaacgactac 720
 accgacctgg atagcaaaac aatcgaggcc atagataccg ccaacctgtt ggcacgctat 780
 ctgcccaagc tggaacgtta cagtctggat gaatggcagc gcattgcctt atccaacaat 840
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ttggaaacgg tatttgcgga ataa

1404

<210> 72

<211> 467

<212> PRT

<213> Neisseria meningitidis

<400> 72

Met Thr Leu Leu Asn Leu Met Ile Met Gln Asp Tyr Gly Ile Ser Val
 1 5 10 15

Cys Leu Thr Leu Thr Pro Tyr Leu Gln His Glu Leu Phe Ser Ala Met
 20 25 30

Lys Ser Tyr Phe Ser Lys Tyr Ile Leu Pro Val Ser Leu Phe Thr Leu
 35 40 45

Pro Leu Ser Leu Ser Pro Ser Val Ser Ala Phe Thr Leu Pro Glu Ala
 50 55 60

Trp Arg Ala Ala Gln Gln His Ser Ala Asp Phe Gln Ala Ser His Tyr
 65 70 75 80

Gln Arg Asp Ala Val Arg Ala Arg Gln Gln Gln Ala Lys Ala Ala Phe
 85 90 95

Leu Pro His Val Ser Ala Asn Ala Ser Tyr Gln Arg Gln Pro Pro Ser
 100 105 110

Ile Ser Ser Thr Arg Glu Thr Gln Gly Trp Ser Val Gln Val Gly Gln
 115 120 125

Thr Leu Phe Asp Ala Ala Lys Phe Ala Gln Tyr Arg Gln Ser Arg Phe
 130 135 140

Asp Thr Gln Ala Ala Glu Gln Arg Phe Asp Ala Ala Arg Glu Glu Leu
 145 150 155 160

Leu Leu Lys Val Ala Glu Ser Tyr Phe Asn Val Leu Leu Ser Arg Asp
 165 170 175

Thr Val Ala Ala His Ala Ala Glu Lys Glu Ala Tyr Ala Gln Gln Val
 180 185 190

Arg Gln Ala Gln Ala Leu Phe Asn Lys Gly Ala Ala Thr Ala Leu Asp
 195 200 205

Ile His Glu Ala Lys Ala Gly Tyr Asp Asn Ala Leu Ala Gln Glu Ile

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210	215	220
Ala Val Leu Ala Glu Lys Gln Thr Tyr Glu Asn Gln Leu Asn Asp Tyr		
225	230	235 240
Thr Asp Leu Asp Ser Lys Gln Ile Glu Ala Ile Asp Thr Ala Asn Leu		
	245	250 255
Leu Ala Arg Tyr Leu Pro Lys Leu Glu Arg Tyr Ser Leu Asp Glu Trp		
	260	265 270
Gln Arg Ile Ala Leu Ser Asn Asn His Glu Tyr Arg Met Gln Gln Leu		
	275	280 285
Ala Leu Gln Ser Ser Gly Gln Ala Leu Arg Ala Ala Gln Asn Ser Arg		
	290	295 300
Tyr Pro Thr Val Ser Ala His Val Gly Tyr Gln Asn Asn Leu Tyr Thr		
	305	310 315 320
Ser Ser Ala Gln Asn Asn Asp Tyr His Tyr Arg Gly Lys Gly Met Ser		
	325	330 335
Val Gly Val Gln Leu Asn Leu Pro Leu Tyr Thr Gly Gly Glu Leu Ser		
	340	345 350
Gly Lys Ile His Glu Ala Glu Ala Gln Tyr Gly Ala Ala Glu Ala Gln		
	355	360 365
Leu Thr Ala Thr Glu Arg His Ile Lys Leu Ala Val Arg Gln Ala Tyr		
	370	375 380
Thr Glu Ser Gly Ala Ala Arg Tyr Gln Ile Met Ala Gln Glu Arg Val		
	385	390 395 400
Leu Glu Ser Ser Arg Leu Lys Leu Lys Ser Thr Glu Thr Gly Gln Gln		
	405	410 415
Tyr Gly Ile Arg Asn Arg Leu Glu Val Ile Arg Ala Arg Gln Glu Val		
	420	425 430
Ala Gln Ala Glu Gln Lys Leu Ala Gln Ala Arg Tyr Lys Phe Met Leu		
	435	440 445
Ala Tyr Leu Arg Leu Val Lys Glu Ser Gly Leu Gly Leu Glu Thr Val		
	450	455 460
Phe Ala Glu		

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465

<210> 73

<211> 1404

<212> DNA

<213> *Neisseria meningitidis*

<400> 73

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ctaccggttt cacttttttac cttgccacta tccctttccc catccgtttc ggctttttacg 180
ctgcctgaag catggcgggc ggcgcagcaa cattcggctg attttcaagc gtcccattac 240
cagcgtgatg cagtgcgcgc acggcaacaa caagccaagg ccgcattcct tccccatgta 300
tccgccaatg ccagctacca gcgccagccg ccacgcattt cttccacccg cgaaacacag 360
ggatggagcg tgcaggtggg acaaacctta tttgacgctg ccaaatttgc acaataccgc 420
caaagcaggt tcgatacgca ggctgcagaa cagcgtttcg atgcggcacg cgaagaattg 480
ctggtgaaag ttgccgaaag ttatttcaac gttttactca gccgagacac cgttgccgcc 540
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aaaggtgctg ccaccgcgct ggatattcac gaagccaaaag ccggttacga caatgccctg 660
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<210> 74

<211> 467

<212> PRT

<213> *Neisseria meningitidis*

<400> 74

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Met Thr Leu Leu Asn Leu Met Ile Met Gln Asp Tyr Gly Ile Ser Val
 1                     5                     10                    15

Cys Leu Thr Leu Thr Pro Tyr Leu Gln His Glu Leu Phe Ser Ala Met
      20                     25                    30

Lys Ser Tyr Phe Ser Lys Tyr Ile Leu Pro Val Ser Leu Phe Thr Leu
      35                     40                    45

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Pro Leu Ser Leu Ser Pro Ser Val Ser Ala Phe Thr Leu Pro Glu Ala
 50 55 60

Trp Arg Ala Ala Gln Gln His Ser Ala Asp Phe Gln Ala Ser His Tyr
 65 70 75 80

Gln Arg Asp Ala Val Arg Ala Arg Gln Gln Gln Ala Lys Ala Ala Phe
 85 90 95

Leu Pro His Val Ser Ala Asn Ala Ser Tyr Gln Arg Gln Pro Pro Ser
 100 105 110

Ile Ser Ser Thr Arg Glu Thr Gln Gly Trp Ser Val Gln Val Gly Gln
 115 120 125

Thr Leu Phe Asp Ala Ala Lys Phe Ala Gln Tyr Arg Gln Ser Arg Phe
 130 135 140

Asp Thr Gln Ala Ala Glu Gln Arg Phe Asp Ala Ala Arg Glu Glu Leu
 145 150 155 160

Leu Leu Lys Val Ala Glu Ser Tyr Phe Asn Val Leu Leu Ser Arg Asp
 165 170 175

Thr Val Ala Ala His Ala Ala Glu Lys Glu Ala Tyr Ala Gln Gln Val
 180 185 190

Arg Gln Ala Gln Ala Leu Phe Asn Lys Gly Ala Ala Thr Ala Leu Asp
 195 200 205

Ile His Glu Ala Lys Ala Gly Tyr Asp Asn Ala Leu Ala Gln Glu Ile
 210 215 220

Ala Val Leu Ala Glu Lys Gln Thr Tyr Glu Asn Gln Leu Asn Asp Tyr
 225 230 235 240

Thr Asp Leu Asp Ser Lys Gln Ile Glu Ala Ile Asp Thr Ala Asn Leu
 245 250 255

Leu Ala Arg Tyr Leu Pro Lys Leu Glu Arg Tyr Ser Leu Asp Glu Trp
 260 265 270

Gln Arg Ile Ala Leu Ser Asn Asn His Glu Tyr Arg Met Gln Gln Leu
 275 280 285

Ala Leu Gln Ser Ser Gly Gln Ala Leu Arg Ala Ala Gln Asn Ser Arg
 290 295 300

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Tyr Pro Thr Val Ser Ala His Val Gly Tyr Gln Asn Asn Leu Tyr Thr
 305 310 315 320

Ser Ser Ala Gln Asn Asn Asp Tyr His Tyr Arg Gly Lys Gly Met Ser
 325 330 335

Val Gly Val Gln Leu Asn Leu Pro Leu Tyr Thr Gly Gly Glu Leu Ser
 340 345 350

Gly Lys Ile His Glu Ala Glu Ala Gln Tyr Gly Ala Ala Glu Ala Gln
 355 360 365

Leu Thr Ala Thr Glu Arg His Ile Lys Leu Ala Val Arg Gln Ala Tyr
 370 375 380

Thr Glu Ser Gly Ala Ala Arg Tyr Gln Ile Met Ala Gln Glu Arg Val
 385 390 395 400

Leu Glu Ser Ser Arg Leu Lys Leu Lys Ser Thr Glu Thr Gly Gln Gln
 405 410 415

Tyr Gly Ile Arg Asn Arg Leu Glu Val Ile Arg Ala Arg Gln Glu Val
 420 425 430

Ala Gln Ala Glu Gln Lys Leu Ala Gln Ala Arg Tyr Lys Phe Met Leu
 435 440 445

Ala Tyr Leu Arg Leu Val Lys Glu Ser Gly Leu Gly Leu Glu Thr Val
 450 455 460

Phe Ala Glu
 465

<210> 75

<211> 1404

<212> DNA

<213> Neisseria meningitidis

<400> 75

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 ctaccggttt cactttttac cttgccacta tccctttccc catccgtttc ggctttttacg 180
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 cagcgtgatg cagtgcgcg acggcaacaa caagccaagg ccgcattcct tccccatgta 300
 tccgccaatg ccagctacca gcgccagccg ccatcgattt cttccaccgc cgaaacacag 360
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caaagcaggt  tcgatacgca  ggctgcagaa  cagcggtttcg  atgcggcacg  cgaagaattg  480
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catgcggcgg  aaaaagaggc  ttatgccag  caggtaaggc  aggcgcaggc  tttattcaat  600
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gccaagaaa  tcgccgtatt  ggctgagaaa  caaacctatg  aaaaccagtt  gaacgactac  720
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cagaacagcc  gctatcccac  cgtttctgcc  catgtcggct  atcagaataa  cctctacact  960
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caagcacggt  ataaattcat  gctggcttat  ttgcgcttgg  tgaaagagag  cgggttaggg  1380
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```

<210> 76

<211> 467

<212> PRT

<213> Neisseria meningitidis

<400> 76

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Met Thr Leu Leu Asn Leu Met Ile Met Gln Asp Tyr Gly Ile Ser Val
  1                      5                      10                      15

```

```

Cys Leu Thr Leu Thr Pro Tyr Leu Gln His Glu Leu Phe Ser Ala Met
          20                      25                      30

```

```

Lys Ser Tyr Phe Ser Lys Tyr Ile Leu Pro Val Ser Leu Phe Thr Leu
          35                      40                      45

```

```

Pro Leu Ser Leu Ser Pro Ser Val Ser Ala Phe Thr Leu Pro Glu Ala
          50                      55                      60

```

```

Trp Arg Ala Ala Gln Gln His Ser Ala Asp Phe Gln Ala Ser His Tyr
          65                      70                      75                      80

```

```

Gln Arg Asp Ala Val Arg Ala Arg Gln Gln Gln Ala Lys Ala Ala Phe
          85                      90                      95

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```

Leu Pro His Val Ser Ala Asn Ala Ser Tyr Gln Arg Gln Pro Pro Ser
          100                      105                      110

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```

Ile Ser Ser Thr Arg Glu Thr Gln Gly Trp Ser Val Gln Val Gly Gln
          115                      120                      125

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Thr Leu Phe Asp Ala Ala Lys Phe Ala Gln Tyr Arg Gln Ser Arg Phe
 130 135 140

Asp Thr Gln Ala Ala Glu Gln Arg Phe Asp Ala Ala Arg Glu Glu Leu
 145 150 155 160

Leu Leu Lys Val Ala Glu Ser Tyr Phe Asn Val Leu Leu Ser Arg Asp
 165 170 175

Thr Val Ala Ala His Ala Ala Glu Lys Glu Ala Tyr Ala Gln Gln Val
 180 185 190

Arg Gln Ala Gln Ala Leu Phe Asn Lys Gly Ala Ala Thr Ala Leu Asp
 195 200 205

Ile His Glu Ala Lys Ala Gly Tyr Asp Asn Ala Leu Ala Gln Glu Ile
 210 215 220

Ala Val Leu Ala Glu Lys Gln Thr Tyr Glu Asn Gln Leu Asn Asp Tyr
 225 230 235 240

Thr Asp Leu Asp Ser Lys Gln Ile Glu Ala Ile Asp Thr Ala Asn Leu
 245 250 255

Leu Ala Arg Tyr Leu Pro Lys Leu Glu Arg Tyr Ser Leu Asp Glu Trp
 260 265 270

Gln Arg Ile Ala Leu Ser Asn Asn His Glu Tyr Arg Met Gln Gln Leu
 275 280 285

Ala Leu Gln Ser Ser Gly Gln Ala Leu Arg Ala Ala Gln Asn Ser Arg
 290 295 300

Tyr Pro Thr Val Ser Ala His Val Gly Tyr Gln Asn Asn Leu Tyr Thr
 305 310 315 320

Ser Ser Ala Gln Asn Asn Asp Tyr His Tyr Arg Gly Lys Gly Met Ser
 325 330 335

Val Gly Val Gln Leu Asn Leu Pro Leu Tyr Thr Gly Gly Glu Leu Ser
 340 345 350

Gly Lys Ile His Glu Ala Glu Ala Gln Tyr Gly Ala Ala Glu Ala Gln
 355 360 365

Leu Thr Ala Thr Glu Arg His Ile Lys Leu Ala Val Arg Gln Ala Tyr
 370 375 380

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Thr Glu Ser Gly Ala Ala Arg Tyr Gln Ile Met Ala Gln Glu Arg Val
 385 390 395 400

Leu Glu Ser Ser Arg Leu Lys Leu Lys Ser Thr Glu Thr Gly Gln Gln
 405 410 415

Tyr Gly Ile Arg Asn Arg Leu Glu Val Ile Arg Ala Arg Gln Glu Val
 420 425 430

Ala Gln Ala Glu Gln Lys Leu Ala Gln Ala Arg Tyr Lys Phe Met Leu
 435 440 445

Ala Tyr Leu Arg Leu Val Lys Glu Ser Gly Leu Gly Leu Glu Thr Val
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Phe Ala Glu
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<210> 77

<211> 1404

<212> DNA

<213> Neisseria meningitidis

<400> 77

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ctacccgttt cactttttac cttgccacta tccctttccc catccgtttc ggctttttacg 180
ctgcctgaag catggcgggc ggcgagcaa cattcggctg attttcaagc gtcccattac 240
cagcgtgatg cagtgcgcgc acggcaacaa caagccaagg ccgcattcct tccccatgta 300
tccgccaatg ccagctacca gcgccagccg ccatcgattt cttccaccgc cgaaacacag 360
ggatggagcg tgcaggtggg acaaacctta tttgacgctg ccaaatttgc acaataaccgc 420
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ctgttgaaag ttgccgaaag ttatttcaac gttttactca gccgagacac cgttgccgcc 540
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aaaggtgctg ccaccgcgct ggatattcac gaagccaaag ccggttacga caatgccctg 660
gcccaagaaa tcgccgtatt ggctgagaaa caaacctatg aaaaccagtt gaacgactac 720
accgacctgg atagcaaaca aatcgaggcc atagataccg ccaacctgtt ggcacgctat 780
ctgccaagc tggaacgtta cagtctggat gaatggcagc gcattgcctt atccaacaat 840
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caagcacggt ataaattcat gctggcttat ttgcgcttgg tgaaagagag cgggttaggg 1380

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ttggaaacgg tatttgcgga ataa

1404

<210> 78

<211> 467

<212> PRT

<213> Neisseria meningitidis

<400> 78

Met Thr Leu Leu Asn Leu Met Ile Met Gln Asp Tyr Gly Ile Ser Val
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Cys Leu Thr Leu Thr Pro Tyr Leu Gln His Glu Leu Phe Ser Ala Met
 20 25 30

Lys Ser Tyr Phe Ser Lys Tyr Ile Leu Pro Val Ser Leu Phe Thr Leu
 35 40 45

Pro Leu Ser Leu Ser Pro Ser Val Ser Ala Phe Thr Leu Pro Glu Ala
 50 55 60

Trp Arg Ala Ala Gln Gln His Ser Ala Asp Phe Gln Ala Ser His Tyr
 65 70 75 80

Gln Arg Asp Ala Val Arg Ala Arg Gln Gln Gln Ala Lys Ala Ala Phe
 85 90 95

Leu Pro His Val Ser Ala Asn Ala Ser Tyr Gln Arg Gln Pro Pro Ser
 100 105 110

Ile Ser Ser Thr Arg Glu Thr Gln Gly Trp Ser Val Gln Val Gly Gln
 115 120 125

Thr Leu Phe Asp Ala Ala Lys Phe Ala Gln Tyr Arg Gln Ser Arg Phe
 130 135 140

Asp Thr Gln Ala Ala Glu Gln Arg Phe Asp Ala Ala Arg Glu Glu Leu
 145 150 155 160

Leu Leu Lys Val Ala Glu Ser Tyr Phe Asn Val Leu Leu Ser Arg Asp
 165 170 175

Thr Val Ala Ala His Ala Ala Glu Lys Glu Ala Tyr Ala Gln Gln Val
 180 185 190

Arg Gln Ala Gln Ala Leu Phe Asn Lys Gly Ala Ala Thr Ala Leu Asp
 195 200 205

Ile His Glu Ala Lys Ala Gly Tyr Asp Asn Ala Leu Ala Gln Glu Ile

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210	215	220
Ala Val Leu Ala Glu Lys Gln Thr Tyr Glu Asn Gln Leu Asn Asp Tyr		
225	230	235 240
Thr Asp Leu Asp Ser Lys Gln Ile Glu Ala Ile Asp Thr Ala Asn Leu		
	245	250 255
Leu Ala Arg Tyr Leu Pro Lys Leu Glu Arg Tyr Ser Leu Asp Glu Trp		
	260	265 270
Gln Arg Ile Ala Leu Ser Asn Asn His Glu Tyr Arg Met Gln Gln Leu		
	275	280 285
Ala Leu Gln Ser Ser Gly Gln Ala Leu Arg Ala Ala Gln Asn Ser Arg		
	290	295 300
Tyr Pro Thr Val Ser Ala His Val Gly Tyr Gln Asn Asn Leu Tyr Thr		
305	310	315 320
Ser Ser Ala Gln Asn Asn Asp Tyr His Tyr Arg Gly Lys Gly Met Ser		
	325	330 335
Val Gly Val Gln Leu Asn Leu Pro Leu Tyr Thr Gly Gly Glu Leu Ser		
	340	345 350
Gly Lys Ile His Glu Ala Glu Ala Gln Tyr Gly Ala Ala Glu Ala Gln		
	355	360 365
Leu Thr Ala Thr Glu Arg His Ile Lys Leu Ala Val Arg Gln Ala Tyr		
	370	375 380
Thr Glu Ser Gly Ala Ala Arg Tyr Gln Ile Met Ala Gln Glu Arg Val		
385	390	395 400
Leu Glu Ser Ser Arg Leu Lys Leu Lys Ser Thr Glu Thr Gly Gln Gln		
	405	410 415
Tyr Gly Ile Arg Asn Arg Leu Glu Val Ile Arg Ala Arg Gln Glu Val		
	420	425 430
Ala Gln Ala Glu Gln Lys Leu Ala Gln Ala Arg Tyr Lys Phe Met Leu		
	435	440 445
Ala Tyr Leu Arg Leu Val Lys Glu Ser Gly Leu Gly Leu Glu Thr Val		
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Phe Ala Glu		

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465

<210> 79

<211> 1404

<212> DNA

<213> Neisseria meningitidis

<400> 79

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cagcgtgatg cagtgcgcgc acggcaacaa caagccaagg ccgcattcct tccccatgta 300
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ggatggagcg tgcaggtggg acaaacctta tttgacgctg ccaaatttgc acaataaccgc 420
caaagcaggt tcgatacgca ggctgcagaa cagcgtttcg atgcggcacg cgaagaattg 480
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```

<210> 80

<211> 467

<212> PRT

<213> Neisseria meningitidis

<400> 80

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Met Thr Leu Leu Asn Leu Met Ile Met Gln Asp Tyr Gly Ile Ser Val
 1                      5                      10                     15

Cys Leu Thr Leu Thr Pro Tyr Leu Gln His Glu Leu Phe Ser Ala Met
      20                      25                     30

Lys Ser Tyr Phe Ser Lys Tyr Ile Leu Pro Val Ser Leu Phe Thr Leu
      35                      40                     45

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Pro Leu Ser Leu Ser Pro Ser Val Ser Ala Phe Thr Leu Pro Glu Ala
 50 55 60

Trp Arg Ala Ala Gln Gln His Ser Ala Asp Phe Gln Ala Ser His Tyr
 65 70 75 80

Gln Arg Asp Ala Val Arg Ala Arg Gln Gln Gln Ala Lys Ala Ala Phe
 85 90 95

Leu Pro His Val Ser Ala Asn Ala Ser Tyr Gln Arg Gln Pro Pro Ser
 100 105 110

Ile Ser Ser Thr Arg Glu Thr Gln Gly Trp Ser Val Gln Val Gly Gln
 115 120 125

Thr Leu Phe Asp Ala Ala Lys Phe Ala Gln Tyr Arg Gln Ser Arg Phe
 130 135 140

Asp Thr Gln Ala Ala Glu Gln Arg Phe Asp Ala Ala Arg Glu Glu Leu
 145 150 155 160

Leu Leu Lys Val Ala Glu Ser Tyr Phe Asn Val Leu Leu Ser Arg Asp
 165 170 175

Thr Val Ala Ala His Ala Ala Glu Lys Glu Ala Tyr Ala Gln Gln Val
 180 185 190

Arg Gln Ala Gln Ala Leu Phe Asn Lys Gly Ala Ala Thr Ala Leu Asp
 195 200 205

Ile His Glu Ala Lys Ala Gly Tyr Asp Asn Ala Leu Ala Gln Glu Ile
 210 215 220

Ala Val Leu Ala Glu Lys Gln Thr Tyr Glu Asn Gln Leu Asn Asp Tyr
 225 230 235 240

Thr Asp Leu Asp Ser Lys Gln Ile Glu Ala Ile Asp Thr Ala Asn Leu
 245 250 255

Leu Ala Arg Tyr Leu Pro Lys Leu Glu Arg Tyr Ser Leu Asp Glu Trp
 260 265 270

Gln Arg Ile Ala Leu Ser Asn Asn His Glu Tyr Arg Met Gln Gln Leu
 275 280 285

Ala Leu Gln Ser Ser Gly Gln Ala Leu Arg Ala Ala Gln Asn Ser Arg
 290 295 300

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Tyr Pro Thr Val Ser Ala His Val Gly Tyr Gln Asn Asn Leu Tyr Thr
 305 310 315 320

Ser Ser Ala Gln Asn Asn Asp Tyr His Tyr Arg Gly Lys Gly Met Ser
 325 330 335

Val Gly Val Gln Leu Asn Leu Pro Leu Tyr Thr Gly Gly Glu Leu Ser
 340 345 350

Gly Lys Ile His Glu Ala Glu Ala Gln Tyr Gly Ala Ala Glu Ala Gln
 355 360 365

Leu Thr Ala Thr Glu Arg His Ile Lys Leu Ala Val Arg Gln Ala Tyr
 370 375 380

Thr Glu Ser Gly Ala Ala Arg Tyr Gln Ile Met Ala Gln Glu Arg Val
 385 390 395 400

Leu Glu Ser Ser Arg Leu Lys Leu Lys Ser Thr Glu Thr Gly Gln Gln
 405 410 415

Tyr Gly Ile Arg Asn Arg Leu Glu Val Ile Arg Ala Arg Gln Glu Val
 420 425 430

Ala Gln Ala Glu Gln Lys Leu Ala Gln Ala Arg Tyr Lys Phe Met Leu
 435 440 445

Ala Tyr Leu Arg Leu Val Lys Glu Ser Gly Leu Gly Leu Glu Thr Val
 450 455 460

Phe Ala Glu
 465

<210> 81

<211> 1404

<212> DNA

<213> Neisseria meningitidis

<400> 81

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 ctacccgttt cactttttac cttgccacta tccctttccc catccgtttc ggctttttacg 180
 ctgcctgaag catggcgggc ggcgcagcaa cattcggttg attttcaagc gtcccattac 240
 cagcgtgatg cagtgcgctg acggcaacaa caagccaagg ccgcattcct tccccatgta 300
 tccgccaatg ccagctacca gcgccagccg ccatcgattt cttccaccog cgaaacacag 360

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PCT/EP00/06943

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ggatggagcg tgcaggtggg acaaacctta tttgacgctg ccaaatttgc acaataccgc 420
caaagcaggt tcgatacgca ggctgcagaa cagcgtttcg atgcggcacg cgaagaattg 480
ctgttgaaag ttgccgaaag ttatttcaac gttttactca gccgagacac cgttgccgcc 540
catgcggcgg aaaaagaggc ttatgccag caggttaaggc aggcgcaggc tttattcaat 600
aaaggtgctg ccaccgcgt ggatattcac gaagccaaag ccggttacga caatgccctg 660
gccaagaaa tcgccgtatt ggctgagaaa caaacctatg aaaaccagtt gaacgactac 720
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caagcacggt ataaattcat gctggcttat ttgcgcttgg tgaaagagag cgggttaggg 1380
ttggaaacgg tatttgcgga ataa 1404

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<210> 82

<211> 467

<212> PRT

<213> Neisseria meningitidis

<400> 82

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Met Thr Leu Leu Asn Leu Met Ile Met Gln Asp Tyr Gly Ile Ser Val
  1                      5                      10                      15

```

```

Cys Leu Thr Leu Thr Pro Tyr Leu Gln His Glu Leu Phe Ser Ala Met
          20                      25                      30

```

```

Lys Ser Tyr Phe Ser Lys Tyr Ile Leu Pro Val Ser Leu Phe Thr Leu
          35                      40                      45

```

```

Pro Leu Ser Leu Ser Pro Ser Val Ser Ala Phe Thr Leu Pro Glu Ala
          50                      55                      60

```

```

Trp Arg Ala Ala Gln Gln His Ser Ala Asp Phe Gln Ala Ser His Tyr
          65                      70                      75                      80

```

```

Gln Arg Asp Ala Val Arg Ala Arg Gln Gln Gln Ala Lys Ala Ala Phe
          85                      90                      95

```

```

Leu Pro His Val Ser Ala Asn Ala Ser Tyr Gln Arg Gln Pro Pro Ser
          100                      105                      110

```

```

Ile Ser Ser Thr Arg Glu Thr Gln Gly Trp Ser Val Gln Val Gly Gln
          115                      120                      125

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Thr Leu Phe Asp Ala Ala Lys Phe Ala Gln Tyr Arg Gln Ser Arg Phe
 130 135 140

Asp Thr Gln Ala Ala Glu Gln Arg Phe Asp Ala Ala Arg Glu Glu Leu
 145 150 155 160

Leu Leu Lys Val Ala Glu Ser Tyr Phe Asn Val Leu Leu Ser Arg Asp
 165 170 175

Thr Val Ala Ala His Ala Ala Glu Lys Glu Ala Tyr Ala Gln Gln Val
 180 185 190

Arg Gln Ala Gln Ala Leu Phe Asn Lys Gly Ala Ala Thr Ala Leu Asp
 195 200 205

Ile His Glu Ala Lys Ala Gly Tyr Asp Asn Ala Leu Ala Gln Glu Ile
 210 215 220

Ala Val Leu Ala Glu Lys Gln Thr Tyr Glu Asn Gln Leu Asn Asp Tyr
 225 230 235 240

Thr Asp Leu Asp Ser Lys Gln Ile Glu Ala Ile Asp Thr Ala Asn Leu
 245 250 255

Leu Ala Arg Tyr Leu Pro Lys Leu Glu Arg Tyr Ser Leu Asp Glu Trp
 260 265 270

Gln Arg Ile Ala Leu Ser Asn Asn His Glu Tyr Arg Met Gln Gln Leu
 275 280 285

Ala Leu Gln Ser Ser Gly Gln Ala Leu Arg Ala Ala Gln Asn Ser Arg
 290 295 300

Tyr Pro Thr Val Ser Ala His Val Gly Tyr Gln Asn Asn Leu Tyr Thr
 305 310 315 320

Ser Ser Ala Gln Asn Asn Asp Tyr His Tyr Arg Gly Lys Gly Met Ser
 325 330 335

Val Gly Val Gln Leu Asn Leu Pro Leu Tyr Thr Gly Gly Glu Leu Ser
 340 345 350

Gly Lys Ile His Glu Ala Glu Ala Gln Tyr Gly Ala Ala Glu Ala Gln
 355 360 365

Leu Thr Ala Thr Glu Arg His Ile Lys Leu Ala Val Arg Gln Ala Tyr
 370 375 380

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Thr Glu Ser Gly Ala Ala Arg Tyr Gln Ile Met Ala Gln Glu Arg Val
 385 390 395 400

Leu Glu Ser Ser Arg Leu Lys Leu Lys Ser Thr Glu Thr Gly Gln Gln
 405 410 415

Tyr Gly Ile Arg Asn Arg Leu Glu Val Ile Arg Ala Arg Gln Glu Val
 420 425 430

Ala Gln Ala Glu Gln Lys Leu Ala Gln Ala Arg Tyr Lys Phe Met Leu
 435 440 445

Ala Tyr Leu Arg Leu Val Lys Glu Ser Gly Leu Gly Leu Glu Thr Val
 450 455 460

Phe Ala Glu
 465

<210> 83

<211> 1404

<212> DNA

<213> Neisseria meningitidis

<400> 83

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 ctaccggttt cacttttttac cttgccacta tccctttccc catccgtttc ggctttttacg 180
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 ggatggagcg tgcaggtggg aaaaacctta tttgacgctg ccaaatttgc acaataccgc 420
 caaagcaggt tcgatacgca ggctgcagaa cagcgttttcg atgcggcacg cgaagaattg 480
 ctgttgaaaag ttgccgaaaag ttattttcaac gttttactca gccgagacac cgttgccgcc 540
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 gcccaagaaa tcgccgtatt ggctgagaaa caaacctatg aaaaccagtt gaacgactac 720
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 ctgccaagc tggaacgtta cagtctggat gaatggcagc gcattgcctt atccaacaat 840
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 aaccggctgg aagtaatacg ggccggcgag gaagtcgccc aagcagaaca gaaactggct 1320

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caagcacggt ataaattcat gctggcttat ttgcgcttgg tgaaagagag cgggttaggg 1380
 ttggaaacgg tatttgcgga ataa 1404

<210> 84

<211> 467

<212> PRT

<213> Neisseria meningitidis

<400> 84

Met Thr Leu Leu Asn Leu Met Ile Met Gln Asp Tyr Gly Ile Ser Val
 1 5 10 15

Cys Leu Thr Leu Thr Pro Tyr Leu Gln His Glu Leu Phe Ser Ala Met
 20 25 30

Lys Ser Tyr Phe Ser Lys Tyr Ile Leu Pro Val Ser Leu Phe Thr Leu
 35 40 45

Pro Leu Ser Leu Ser Pro Ser Val Ser Ala Phe Thr Leu Pro Glu Ala
 50 55 60

Trp Arg Ala Ala Gln Gln His Ser Ala Asp Phe Gln Ala Ser His Tyr
 65 70 75 80

Gln Arg Asp Ala Val Arg Ala Arg Gln Gln Gln Ala Lys Ala Ala Phe
 85 90 95

Leu Pro His Val Ser Ala Asn Ala Ser Tyr Gln Arg Gln Pro Pro Ser
 100 105 110

Ile Ser Ser Thr Arg Glu Thr Gln Gly Trp Ser Val Gln Val Gly Gln
 115 120 125

Thr Leu Phe Asp Ala Ala Lys Phe Ala Gln Tyr Arg Gln Ser Arg Phe
 130 135 140

Asp Thr Gln Ala Ala Glu Gln Arg Phe Asp Ala Ala Arg Glu Glu Leu
 145 150 155 160

Leu Leu Lys Val Ala Glu Ser Tyr Phe Asn Val Leu Leu Ser Arg Asp
 165 170 175

Thr Val Ala Ala His Ala Ala Glu Lys Glu Ala Tyr Ala Gln Gln Val
 180 185 190

Arg Gln Ala Gln Ala Leu Phe Asn Lys Gly Ala Ala Thr Ala Leu Asp
 195 200 205

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Ile His Glu Ala Lys Ala Gly Tyr Asp Asn Ala Leu Ala Gln Glu Ile
 210 215 220

Ala Val Leu Ala Glu Lys Gln Thr Tyr Glu Asn Gln Leu Asn Asp Tyr
 225 230 235 240

Thr Asp Leu Asp Ser Lys Gln Ile Glu Ala Ile Asp Thr Ala Asn Leu
 245 250 255

Leu Ala Arg Tyr Leu Pro Lys Leu Glu Arg Tyr Ser Leu Asp Glu Trp
 260 265 270

Gln Arg Ile Ala Leu Ser Asn Asn His Glu Tyr Arg Met Gln Gln Leu
 275 280 285

Ala Leu Gln Ser Ser Gly Gln Ala Leu Arg Ala Ala Gln Asn Ser Arg
 290 295 300

Tyr Pro Thr Val Ser Ala His Val Gly Tyr Gln Asn Asn Leu Tyr Thr
 305 310 315 320

Ser Ser Ala Gln Asn Asn Asp Tyr His Tyr Arg Gly Lys Gly Met Ser
 325 330 335

Val Gly Val Gln Leu Asn Leu Pro Leu Tyr Thr Gly Gly Glu Leu Ser
 340 345 350

Gly Lys Ile His Glu Ala Glu Ala Gln Tyr Gly Ala Ala Glu Ala Gln
 355 360 365

Leu Thr Ala Thr Glu Arg His Ile Lys Leu Ala Val Arg Gln Ala Tyr
 370 375 380

Thr Glu Ser Gly Ala Ala Arg Tyr Gln Ile Met Ala Gln Glu Arg Val
 385 390 395 400

Leu Glu Ser Ser Arg Leu Lys Leu Lys Ser Thr Glu Thr Gly Gln Gln
 405 410 415

Tyr Gly Ile Arg Asn Arg Leu Glu Val Ile Arg Ala Arg Gln Glu Val
 420 425 430

Ala Gln Ala Glu Gln Lys Leu Ala Gln Ala Arg Tyr Lys Phe Met Leu
 435 440 445

Ala Tyr Leu Arg Leu Val Lys Glu Ser Gly Leu Gly Leu Glu Thr Val
 450 455 460

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Phe Ala Glu

465

<210> 85

<211> 1404

<212> DNA

<213> *Neisseria meningitidis*

<400> 85

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ctacccgttt cacttttttac cttgccacta tccctttccc catccgtttc ggcttttacg 180
ctgcctgaag catggcgggc ggcgagcaa cattcggtg attttcaagc gtcccattac 240
cagcgtgatg cagtgcgcgc acggcaacaa caagccaagg ccgcattcct tccccatgta 300
tccgccaatg ccagctacca gcgccagccg ccatcgattt cttccaccgc cgaaacacag 360
ggatggagcg tgcaggtggg acaaacctta tttgacgctg ccaaatttgc acaataccgc 420
caaagcaggt tcgatacgca ggctgcagaa cagcgtttcg atgcggcacg cgaagaattg 480
ctgttgaaag ttgccgaaag ttatttcaac gttttactca gccgagacac cgttgccgcc 540
catgcggcgg aaaaagaggc ttatgccag caggttaagg aggcgcaggc tttattcaat 600
aaaggtgctg ccaccgcgct ggatattcac gaagccaaag ccggttacga caatgccctg 660
gcccaagaaa tcgccgtatt ggctgagaaa caaacctatg aaaaccagtt gaacgactac 720
accgacctgg atagcaaaca aatcgaggcc atagataccg ccaacctgtt ggcacgctat 780
ctgccaagc tggaaagctta cagtctggat gaatggcagc gcattgcctt atccaacaat 840
catgaatacc ggatgcagca gcttgccctg caaagcagcg gacaggcgct tcgggcagca 900
cagaacagcc gctatcccac cgtttctgcc catgtcggct atcagaataa cctctacact 960
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caatacgggg ccgccgaagc acagctgacc gcaaccgagc ggcacatcaa actcgccgta 1140
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ttgaaagca gccgtttgaa actgaaatcg accgaaaccg gccacaata cggcatccgc 1260
aaccggctgg aagtaatacg ggcgcggcag gaagtcgccc aagcagaaca gaaactggct 1320
caagcacggt ataaattcat gctggcttat ttgcgcttg tgaaagagag cgggttaggg 1380
ttgaaacgg tatttgcgga ataa 1404

```

<210> 86

<211> 467

<212> PRT

<213> *Neisseria meningitidis*

<400> 86

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Met Thr Leu Leu Asn Leu Met Ile Met Gln Asp Tyr Gly Ile Ser Val
  1             5             10            15

Cys Leu Thr Leu Thr Pro Tyr Leu Gln His Glu Leu Phe Ser Ala Met
      20             25            30

Lys Ser Tyr Phe Ser Lys Tyr Ile Leu Pro Val Ser Leu Phe Thr Leu

```

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35	40	45
Pro Leu Ser Leu Ser Pro Ser Val Ser Ala Phe Thr Leu Pro Glu Ala		
50	55	60
Trp Arg Ala Ala Gln Gln His Ser Ala Asp Phe Gln Ala Ser His Tyr		
65	70	75
Gln Arg Asp Ala Val Arg Ala Arg Gln Gln Gln Ala Lys Ala Ala Phe		
85	90	95
Leu Pro His Val Ser Ala Asn Ala Ser Tyr Gln Arg Gln Pro Pro Ser		
100	105	110
Ile Ser Ser Thr Arg Glu Thr Gln Gly Trp Ser Val Gln Val Gly Gln		
115	120	125
Thr Leu Phe Asp Ala Ala Lys Phe Ala Gln Tyr Arg Gln Ser Arg Phe		
130	135	140
Asp Thr Gln Ala Ala Glu Gln Arg Phe Asp Ala Ala Arg Glu Glu Leu		
145	150	155
Leu Leu Lys Val Ala Glu Ser Tyr Phe Asn Val Leu Leu Ser Arg Asp		
165	170	175
Thr Val Ala Ala His Ala Ala Glu Lys Glu Ala Tyr Ala Gln Gln Val		
180	185	190
Arg Gln Ala Gln Ala Leu Phe Asn Lys Gly Ala Ala Thr Ala Leu Asp		
195	200	205
Ile His Glu Ala Lys Ala Gly Tyr Asp Asn Ala Leu Ala Gln Glu Ile		
210	215	220
Ala Val Leu Ala Glu Lys Gln Thr Tyr Glu Asn Gln Leu Asn Asp Tyr		
225	230	235
Thr Asp Leu Asp Ser Lys Gln Ile Glu Ala Ile Asp Thr Ala Asn Leu		
245	250	255
Leu Ala Arg Tyr Leu Pro Lys Leu Glu Arg Tyr Ser Leu Asp Glu Trp		
260	265	270
Gln Arg Ile Ala Leu Ser Asn Asn His Glu Tyr Arg Met Gln Gln Leu		
275	280	285
Ala Leu Gln Ser Ser Gly Gln Ala Leu Arg Ala Ala Gln Asn Ser Arg		

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290 295 300
 Tyr Pro Thr Val Ser Ala His Val Gly Tyr Gln Asn Asn Leu Tyr Thr
 305 310 315 320
 Ser Ser Ala Gln Asn Asn Asp Tyr His Tyr Arg Gly Lys Gly Met Ser
 325 330 335
 Val Gly Val Gln Leu Asn Leu Pro Leu Tyr Thr Gly Gly Glu Leu Ser
 340 345 350
 Gly Lys Ile His Glu Ala Glu Ala Gln Tyr Gly Ala Ala Glu Ala Gln
 355 360 365
 Leu Thr Ala Thr Glu Arg His Ile Lys Leu Ala Val Arg Gln Ala Tyr
 370 375 380
 Thr Glu Ser Gly Ala Ala Arg Tyr Gln Ile Met Ala Gln Glu Arg Val
 385 390 395 400
 Leu Glu Ser Ser Arg Leu Lys Leu Lys Ser Thr Glu Thr Gly Gln Gln
 405 410 415
 Tyr Gly Ile Arg Asn Arg Leu Glu Val Ile Arg Ala Arg Gln Glu Val
 420 425 430
 Ala Gln Ala Glu Gln Lys Leu Ala Gln Ala Arg Tyr Lys Phe Met Leu
 435 440 445
 Ala Tyr Leu Arg Leu Val Lys Glu Ser Gly Leu Gly Leu Glu Thr Val
 450 455 460
 Phe Ala Glu
 465

<210> 87

<211> 1404

<212> DNA

<213> Neisseria meningitidis

<400> 87

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 ctacccgttt cactttttac cttgccacta tccctttccc catccgtttc ggctttttacg 180
 ctgcctgaag catggcgggc ggcgcagcaa cattcggctg attttcaagc gtcccattac 240
 cagcgtgatg cagtgcgcgc acggcaacaa caagccaagg ccgcattcct tccccatgta 300
 tccgccaatg ccagctacca gcgccagccg ccatcgattt cttccaccgc cgaaacacag 360

WO 01/04150

PCT/EP00/06943

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ggatggagcg tgcaggtggg acaaacctta tttgacgctg ccaaatttgc acaataccgc 420
caaagcaggt tcgatacgca ggctgcagaa cagcgtttcg atgcggcacg cgaagaattg 480
ctgttgaaag ttgccgaaag ttatttcaac gttttactca gccgagacac cgttgccgcc 540
catgcggcgg aaaaagaggc ttatgcccag caggtaaggc aggcgcaggc tttattcaat 600
aaaggtgctg ccaccgcgct ggatattcac gaagccaaag ccggttacga caatgccttg 660
gccaagaaa tcgccgtatt ggctgagaaa caaacctatg aaaaccagtt gaacgactac 720
accgacctgg atagcaaaca aatcgaggcc atagataccg ccaacctgtt ggcacgctat 780
ctgccaagc tggaacgtta cagtctggat gaatggcagc gcattgcctt atccaacaat 840
catgaatacc ggatgcagca gcttgccctg caaagcagcg gacaggcgct tcgggcagca 900
cagaacagcc gctatcccac cgtttctgcc catgtcggt atcagaataa cctctacact 960
tcatctgcgc agaataatga ctaccactat cggggcaaa ggatgagcgt cggcgtagag 1020
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caatacgggg ccgccgaagc acagctgacc gcaaccgagc ggcacatcaa actcgccgta 1140
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ttggaaagca gccgtttgaa actgaaatcg accgaaaccg gccaacaata cggcatccgc 1260
aaccggctgg aagtaatacg ggcgcggcag gaagtcgccc aagcagaaca gaaactggct 1320
caagcacggt ataaattcat gctggcttat ttgcgcttgg tgaaagagag cgggttaggg 1380
ttggaaacgg tatttgcgga ataa 1404

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<210> 88

<211> 467

<212> PRT

<213> Neisseria meningitidis

<400> 88

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Met Thr Leu Leu Asn Leu Met Ile Met Gln Asp Tyr Gly Ile Ser Val
  1              5              10              15

```

```

Cys Leu Thr Leu Thr Pro Tyr Leu Gln His Glu Leu Phe Ser Ala Met
      20              25              30

```

```

Lys Ser Tyr Phe Ser Lys Tyr Ile Leu Pro Val Ser Leu Phe Thr Leu
    35              40              45

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```

Pro Leu Ser Leu Ser Pro Ser Val Ser Ala Phe Thr Leu Pro Glu Ala
    50              55              60

```

```

Trp Arg Ala Ala Gln Gln His Ser Ala Asp Phe Gln Ala Ser His Tyr
    65              70              75              80

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```

Gln Arg Asp Ala Val Arg Ala Arg Gln Gln Gln Ala Lys Ala Ala Phe
      85              90              95

```

```

Leu Pro His Val Ser Ala Asn Ala Ser Tyr Gln Arg Gln Pro Pro Ser
    100              105              110

```

```

Ile Ser Ser Thr Arg Glu Thr Gln Gly Trp Ser Val Gln Val Gly Gln
    115              120              125

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Thr Leu Phe Asp Ala Ala Lys Phe Ala Gln Tyr Arg Gln Ser Arg Phe
 130 135 140

Asp Thr Gln Ala Ala Glu Gln Arg Phe Asp Ala Ala Arg Glu Glu Leu
 145 150 155 160

Leu Leu Lys Val Ala Glu Ser Tyr Phe Asn Val Leu Leu Ser Arg Asp
 165 170 175

Thr Val Ala Ala His Ala Ala Glu Lys Glu Ala Tyr Ala Gln Gln Val
 180 185 190

Arg Gln Ala Gln Ala Leu Phe Asn Lys Gly Ala Ala Thr Ala Leu Asp
 195 200 205

Ile His Glu Ala Lys Ala Gly Tyr Asp Asn Ala Leu Ala Gln Glu Ile
 210 215 220

Ala Val Leu Ala Glu Lys Gln Thr Tyr Glu Asn Gln Leu Asn Asp Tyr
 225 230 235 240

Thr Asp Leu Asp Ser Lys Gln Ile Glu Ala Ile Asp Thr Ala Asn Leu
 245 250 255

Leu Ala Arg Tyr Leu Pro Lys Leu Glu Arg Tyr Ser Leu Asp Glu Trp
 260 265 270

Gln Arg Ile Ala Leu Ser Asn Asn His Glu Tyr Arg Met Gln Gln Leu
 275 280 285

Ala Leu Gln Ser Ser Gly Gln Ala Leu Arg Ala Ala Gln Asn Ser Arg
 290 295 300

Tyr Pro Thr Val Ser Ala His Val Gly Tyr Gln Asn Asn Leu Tyr Thr
 305 310 315 320

Ser Ser Ala Gln Asn Asn Asp Tyr His Tyr Arg Gly Lys Gly Met Ser
 325 330 335

Val Gly Val Gln Leu Asn Leu Pro Leu Tyr Thr Gly Gly Glu Leu Ser
 340 345 350

Gly Lys Ile His Glu Ala Glu Ala Gln Tyr Gly Ala Ala Glu Ala Gln
 355 360 365

Leu Thr Ala Thr Glu Arg His Ile Lys Leu Ala Val Arg Gln Ala Tyr
 370 375 380

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Thr Glu Ser Gly Ala Ala Arg Tyr Gln Ile Met Ala Gln Glu Arg Val
385 390 395 400

Leu Glu Ser Ser Arg Leu Lys Leu Lys Ser Thr Glu Thr Gly Gln Gln
405 410 415

Tyr Gly Ile Arg Asn Arg Leu Glu Val Ile Arg Ala Arg Gln Glu Val
420 425 430

Ala Gln Ala Glu Gln Lys Leu Ala Gln Ala Arg Tyr Lys Phe Met Leu
435 440 445

Ala Tyr Leu Arg Leu Val Lys Glu Ser Gly Leu Gly Leu Glu Thr Val
450 455 460

Phe Ala Glu
465

<210> 89

<211> 1404

<212> DNA

<213> Neisseria meningitidis

<400> 89

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ctaccggttt cactttttac cttgccacta tccctttccc catccgtttc ggctttttacg 180
ctgcctgaag catggcgggc ggcgagcaa cattcggttg attttcaagc gtcccattac 240
cagcgtgatg cagtgcgcgc acggcaacaa caagccaagg ccgcattcct tccccatgta 300
tccgccaatg ccagctacca gcgccagccg ccatcgattt cttccaccgc cgaaacacag 360
ggatggagcg tgcaggtggg acaaacctta tttgacgctg ccaaatttgc acaataccgc 420
caaagcaggt tcgatacgca ggctgcagaa cagcgttttc atgcggcacg cgaagaattg 480
ctgttgaaaag ttgccgaaaag ttattttcaac gttttactca gccgagacac cgttgccgcc 540
catgcggcgcg aaaaagaggc ttatgccagc caggtaaggc aggcgcaggc tttattcaat 600
aaaggtgctg ccaccgcgct ggatattcac gaagccaaag ccggttacga caatgccctg 660
gcccaagaaa tcgccgtatt ggctgagaaa caaacctatg aaaaccagtt gaacgactac 720
accgacctgg atagcaaaca aatcgaggcc atagataccg ccaacctggt ggccacgctat 780
ctgccaagc tggaacgta cagtctggat gaatggcagc gcattgcctt atccaacaat 840
catgaatacc ggatgcagca gcttgccctg caaagcagcg gacaggcgct tcgggcagca 900
cagaacagcc gctatcccac cgtttctgcc catgtcggct atcagaataa cctctacact 960
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ttggaaagca gccgtttgaa actgaaatcg accgaaaccg gccacaataa cggcatccgc 1260
aaccggctgg aagtaatacg ggcgcggcag gaagtcgccc aagcagaaca gaaactggct 1320

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caagcacggt ataaattcat gctggcttat ttgcgcttgg tgaaagagag cgggttaggg 1380
 ttggaaacgg tatttgcgga ataa 1404

<210> 90

<211> 467

<212> PRT

<213> Neisseria meningitidis

<400> 90

Met Thr Leu Leu Asn Leu Met Ile Met Gln Asp Tyr Gly Ile Ser Val
 1 5 10 15

Cys Leu Thr Leu Thr Pro Tyr Leu Gln His Glu Leu Phe Ser Ala Met
 20 25 30

Lys Ser Tyr Phe Ser Lys Tyr Ile Leu Pro Val Ser Leu Phe Thr Leu
 35 40 45

Pro Leu Ser Leu Ser Pro Ser Val Ser Ala Phe Thr Leu Pro Glu Ala
 50 55 60

Trp Arg Ala Ala Gln Gln His Ser Ala Asp Phe Gln Ala Ser His Tyr
 65 70 75 80

Gln Arg Asp Ala Val Arg Ala Arg Gln Gln Gln Ala Lys Ala Ala Phe
 85 90 95

Leu Pro His Val Ser Ala Asn Ala Ser Tyr Gln Arg Gln Pro Pro Ser
 100 105 110

Ile Ser Ser Thr Arg Glu Thr Gln Gly Trp Ser Val Gln Val Gly Gln
 115 120 125

Thr Leu Phe Asp Ala Ala Lys Phe Ala Gln Tyr Arg Gln Ser Arg Phe
 130 135 140

Asp Thr Gln Ala Ala Glu Gln Arg Phe Asp Ala Ala Arg Glu Glu Leu
 145 150 155 160

Leu Leu Lys Val Ala Glu Ser Tyr Phe Asn Val Leu Leu Ser Arg Asp
 165 170 175

Thr Val Ala Ala His Ala Ala Glu Lys Glu Ala Tyr Ala Gln Gln Val
 180 185 190

Arg Gln Ala Gln Ala Leu Phe Asn Lys Gly Ala Ala Thr Ala Leu Asp
 195 200 205

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Ile His Glu Ala Lys Ala Gly Tyr Asp Asn Ala Leu Ala Gln Glu Ile
 210 215 220

Ala Val Leu Ala Glu Lys Gln Thr Tyr Glu Asn Gln Leu Asn Asp Tyr
 225 230 235 240

Thr Asp Leu Asp Ser Lys Gln Ile Glu Ala Ile Asp Thr Ala Asn Leu
 245 250 255

Leu Ala Arg Tyr Leu Pro Lys Leu Glu Arg Tyr Ser Leu Asp Glu Trp
 260 265 270

Gln Arg Ile Ala Leu Ser Asn Asn His Glu Tyr Arg Met Gln Gln Leu
 275 280 285

Ala Leu Gln Ser Ser Gly Gln Ala Leu Arg Ala Ala Gln Asn Ser Arg
 290 295 300

Tyr Pro Thr Val Ser Ala His Val Gly Tyr Gln Asn Asn Leu Tyr Thr
 305 310 315 320

Ser Ser Ala Gln Asn Asn Asp Tyr His Tyr Arg Gly Lys Gly Met Ser
 325 330 335

Val Gly Val Gln Leu Asn Leu Pro Leu Tyr Thr Gly Gly Glu Leu Ser
 340 345 350

Gly Lys Ile His Glu Ala Glu Ala Gln Tyr Gly Ala Ala Glu Ala Gln
 355 360 365

Leu Thr Ala Thr Glu Arg His Ile Lys Leu Ala Val Arg Gln Ala Tyr
 370 375 380

Thr Glu Ser Gly Ala Ala Arg Tyr Gln Ile Met Ala Gln Glu Arg Val
 385 390 395 400

Leu Glu Ser Ser Arg Leu Lys Leu Lys Ser Thr Glu Thr Gly Gln Gln
 405 410 415

Tyr Gly Ile Arg Asn Arg Leu Glu Val Ile Arg Ala Arg Gln Glu Val
 420 425 430

Ala Gln Ala Glu Gln Lys Leu Ala Gln Ala Arg Tyr Lys Phe Met Leu
 435 440 445

Ala Tyr Leu Arg Leu Val Lys Glu Ser Gly Leu Gly Leu Glu Thr Val
 450 455 460

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Phe Ala Glu
465

<210> 91
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 91
gaacatggat cccgtccaca cactttacg 29

<210> 92
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 92
gcggccgaat tccaacaggg tcaatgaagt 30

<210> 93
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 93
ctgttggaat tcggccgctt gtagcaaaca ggct 34

<210> 94
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 94
tagtacggta ccgattcact tgggtgctt 28

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<210> 95
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 95
gcttgtggta ccatatgagc aaacaggctg aaaccagt 38

<210> 96
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 96
tcaatcctcg agttgcggct ttttctgctc tt 32

<210> 97
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 97
gctttgactt cattgaccct gttggcattg gcc 33

<210> 98
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 98
tatccaccaa ctggtcaatc gtggtcatatc cgg 33

<210> 99
<211> 33
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 99

ccacgctgat tattgcttec ttccctggtg ctg 33

$\langle 210 \rangle$ 100

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 100

accggcata gagtccgaac gccaatattt ttg 33

<210> 101

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 101

tgtttccac ccaaacttac . 20

<210> 102

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 102

gttcgtggat gcagacatag 20

<210> 103

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

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<400> 103
gcctgacact gacgccctat ttgcaacatg aac 33

<210> 104
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 104
taccgtgctt gagccagttt ctgttctgct tgg 33

<210> 105
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 105
accgtgaggc ggacttggc 19

<210> 106
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 106
tggcccgcat tgtcgggttt aaagccgtct tcg 33

<210> 107
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 107
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<210> 108
<211> 20
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 108
gcttcgcaaa agccgacttg

20

<210> 109
<211> 20
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 109
ggcaaccgat tgccatcatc

20

<210> 110
<211> 20
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 110
tttccgtttt cagacggctg

20

<210> 111
<211> 21
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 111
aagaccgtaa aaatgcaggc g

21

<210> 112
<211> 20
<212> DNA
<213> Artificial Sequence

WO 01/04150

PCT/EP00/06943

<220>

<223> Description of Artificial Sequence: primer

<400> 112

tttccgactt tgcgggagtg

20

<210> 113

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 113

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<211> 24

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24

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<223> Description of Artificial Sequence: primer

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PCT/EP00/06943

<400> 116

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